

# Regional Integration Arrangements

## Static Economic Theory, Quantitative Findings, and Policy Guidelines

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This paper reviews the static theory of regional integration arrangements and considers the economic impact of such arrangements, based on recent quantitative studies of customs unions and free trade areas.



## Summary findings

DeRosa reviews the static theory of regional integration arrangements, identifying and analyzing the impact of such arrangements on the trade and welfare of member countries, nonmember countries, and the world at large.

He develops eight policy guidelines that apply mainly to small trading countries unable to influence their international terms of trade or to cease trading entirely with nonmember countries, assuming increasing cost conditions in member countries, homogeneous traded goods, and perfect competition.

The guidelines advise establishing regional facilities for compensatory lump-sum transfers or other intrabloc payments to avoid the possibility that, where a trading bloc would be welfare-improving overall, the bloc would not be formed because of the (justified) recalcitrance of one or more would-be member countries whose economic welfare might be reduced by the adoption of the regional trade arrangement.

Other guidelines are appropriate on commonsense grounds. For example: Regional trade arrangements will be welfare-improving if they are formed by countries that are predominantly least-cost producers of exportables, or if they give rise to increased imports from all trading partners.

Yet few if any extant customs unions or free trade areas meet such simple guidelines fully.

To some extent, customs unions and free trade areas are expected to result in cessation of trade (in homogeneous goods) with nonmember countries. Where trade between member countries and nonmember countries is expected to continue under regional arrangements (as real-world data suggest), internationally determined terms of trade rather than regionally determined terms of trade are likely to prevail within the trading bloc, limiting the welfare-improving effects of creating trade but not the welfare-reducing effects of trade diversion.

Among the most interesting and arguably “operational” policy guidelines to emerge from DeRosa’s analysis are those concerning countries that might choose to join (1) a large rather than small regional trading bloc, (2) a regional integration arrangement to overcome hindrances facing exports to third countries, or (3) a regional integration arrangement that could have strong pro-competitive effects under imperfect competition and increasing returns to scale. Guidelines 1 and 2 concern mostly developing countries; guideline 3 concerns mostly advanced countries. But the economic bases for the three guidelines are relevant and compelling.

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**Regional Integration Arrangements: Static Economic Theory,  
Quantitative Findings, and Policy Guidelines**

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## Summary

Regional integration arrangements have been the subject of considerable economic analysis, beginning with seminal contributions to the "customs union issue" by Viner (1950) and Meade (1955). Today, both theoretical work and quantitative work on regional integration arrangements have been newly inspired by the current resurgence of regionalism and the issues it poses for both advanced countries and less developed countries, and for the international community of nations which is concerned for continued progress in international development and the global trading system.

This paper reviews the static theory of regional integration arrangements and considers the relevant findings of recent quantitative studies of new and "revitalized" regional integration arrangements, identifying and analyzing, as possible, the expected or actual impacts of regional integration agreements on trade and welfare of member countries, non-member countries, and the world at large. The paper also derives a limited number of policy guidelines for advanced countries and less developed countries considering joining either large or small regional trading blocs.

The impacts of regionalism and discriminatory trade policies in static economic theory are frequently dependent upon the circumstances surrounding individual regional integration arrangements and member countries, consistent with the theory of second-best in which seeming movements in the direction of Pareto-optimality are not always welfare-improving. Thus, beginning with Viner's early conclusion that regional integration arrangements might be predominantly trade-diverting and therefore welfare-reducing, the static theory of regional integration arrangements has mainly failed to yield universally applicable guidelines for policy making.

The paper derives eight policy guidelines from the static theory of regional integration arrangements. The policy guidelines are applicable mainly to small trading countries unable to influence their international terms of trade or to cease trading entirely with non-member countries, under the assumptions of increasing cost conditions in member countries, homogenous traded goods, and perfect competition. The policy guidelines apply appropriately to many advanced countries and most less developed countries whose combined trade accounts for only a small fraction of world trade.

The policy guidelines indicate the advisability of establishing regional facilities for compensatory lump-sum transfers or other intra-bloc payments to avoid the possibility that, where a trading bloc would be welfare-improving in the aggregate, the bloc would not be formed because of the (justified) recalcitrance of one or more would-be member countries whose economic welfare might be reduced by the adoption of the regional integration arrangement.

Other policy guidelines are appropriate on common-sense if not tautological grounds. For instance, that regional integration arrangements will be welfare-improving if they are formed by countries that are predominantly least-cost producers of exportables or if they give rise to increased imports from all trading partners are reasonable policy guidelines in simplest economic terms. Yet, few if any extant customs unions or free trade areas meet such simple guidelines fully.

A subtly important aspect of the policy guidelines and underlying static theory of regional integration arrangements is the extent to which customs unions and free trade areas are expected to result in cessation of trade (in homogenous goods) with non-member countries. Where trade between member countries and non-member countries is expected to continue under a regional integration arrangement (as suggested by real world data), internationally determined terms of trade rather than regionally determined terms of trade are likely to prevail within the trading bloc, limiting welfare-improving trade creation effects but not welfare-reducing trade diversion effects. This is readily apparent in the Vinerian model, and is likely to be relevant to similar outcomes in the Meade model that are not treated extensively in the economic literature.

Among the most interesting and arguably "operational" policy guidelines to emerge from the analysis of the paper are those concerning countries that might choose to join (1) a large rather than small regional trading bloc, (2) a regional integration arrangement to overcome hindrances facing exports to third-countries, or (3) a regional integration arrangement that could have strong pro-competitive effects under imperfect competition and increasing returns to scale. The first two policy guidelines confront mainly less developed countries, while the third policy guideline confronts mainly advanced countries. Quantitative support for the three policy guidelines is rather "thin," and quantitative support for the third policy guideline is particularly subject to further theoretical and methodological refinement. Nonetheless, the economic bases for the three policy guidelines are among the most relevant and compelling presented in the paper.

With regard to the body of quantitative "evidence" on regional integration arrangements, few *ex post* (empirical) quantitative studies or *ex ante* (analytical) quantitative studies directly investigate policy guidelines *per se*. Presumably owing to the exigencies of the theory of second best, both *ex post* and *ex ante* quantitative studies have mainly investigated the effects of regionalism on net trade creation and economic welfare on a "one-off" or case-by-case basis, neglecting more direct or systematic analysis of the limited number of general propositions that emerge from the static theory of regional integration arrangements.

Increasingly wide use of CGE models and other analytical models of regional integration arrangements has raised critical questions about the appropriate specification and functional form of key behavioral and technical relationships in these models. In particular, different assumptions regarding the extent of firm-level economies of scale and different specifications of demand systems for differentiated traded goods (rather than homogeneous traded goods favored in neoclassical trade theory) can matter importantly for the magnitude of trade and welfare impacts simulated by analytical models. Thus, *ex ante* studies employing CGE models need to be confronted more frequently by real world data in the process of their construction and the evaluation of their simulation results.

Nonetheless, the paper concludes that CGE and other analytical models are among the most important tools that both applied economists and economic theoreticians today bring to the problem of deriving useful policy guidelines on regional integration arrangements. This conclusion applies particularly to deriving policy guidelines from the so-called large union Meade model – the theoretical model that comes closest to encompassing the circumstances of the emerging "global economy" in which extensive if not pervasive regionalism might be expected to have appreciable-to-significant spillover and feedback effects on international trade and welfare.

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## **1. Introduction**

Amid strong centripetal forces forging closer economic relations among countries today, regionalism has emerged as a force potentially rivaling multilateralism with, as yet, uncertain implications for the world trading system and the process of globalization itself. The European Union (EU) and the North American Free Trade Agreement (Nafta) among Canada, Mexico, and the United States are the two most prominent regional integration arrangements. However, well over 50 regional integration and trading arrangements are currently in force around the world, with the vast number of these arrangements involving mainly less developed countries (IMF 1994).

Both regionalism and multilateralism might be expected to result in economic integration of neighboring countries. However, economic integration, which is defined here broadly as the equalization of relative prices for traded goods among countries, need not be the same in both cases because of the fundamental gulf between multilateralism's reliance on non-discriminatory trade policies and regionalism's reliance on discriminatory trade policies. During the last half century, multilateralism has been pursued through multilateral trade negotiations based on the most-favored-nation (MFN) principle underlying the General Agreement on Tariffs and Trade (GATT) and its successor, the World Trade Organization (WTO), and it has been widely regarded as the most appropriate path to achieving the "first-best" outcome of world economic integration. However, since the late-1980s and frustrations growing out of the protracted length of the Uruguay Round negotiations concluded in 1994, regionalism has come to be regarded in many quarters as a "stepping stone" (rather than "stumbling block") to achieving world economic

integration, albeit by a more circuitous path involving, from an international political economy perspective, potential competition if not conflict with multilateralism as a means of achieving wider trade liberalization in the world economy.<sup>1</sup>

Bilateralism and regionalism have a longer history than multilateralism in modern history. Regionalism dates to the 19<sup>th</sup> Century when, in the wake of the first commercial treaty to incorporate an unconditional MFN clause, the Cobden (Anglo-French) Treaty of 1860, a number of small European states that had established customs unions among themselves also sought to form trading alliances with France featuring the same MFN clause negotiated by France with Britain. Notably in this case, regionalism contributed to the spread of lower trade barriers in much of Western Europe as bilateral trade agreements based on the MFN principle multiplied in number during the late-1800s.<sup>2</sup>

Regional integration arrangements have been the subject of considerable economic analysis, beginning with the seminal contributions to the "customs union issue" by Viner (1950) and Meade (1955). Decisions facing both advanced and less developed countries about participation in and design of regional integration arrangements have newly inspired both theoretical work and quantitative work on regional integration arrangements. More generally, needs of the international community for better understanding and insight to the actual or potential effects of regionalism on the global trading system and emerging new global economy have also spurred new work on regional integration arrangements.

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<sup>1</sup> See, Lawrence (1991), Summers (1991), and Bhagwati (1992).

<sup>2</sup> The Cobden Treaty and subsequent bilateral trading arrangements between France, on the one hand, and the Zollverein states and other small European states, on the other hand, resulted in an effective multilateral arrangement, ushering in an unprecedented era of liberal trade in Europe that lasted until the 1914, as discussed recently by Irwin (1993). Although bilateral and regional trading arrangements played an integral role, the liberal outcome for trade stemmed from the widespread adoption of the MFN principle and, arguably, the "domino effect" of smaller states falling in line with the more liberal trade policies of Britain and France.

This paper reviews the static theory of regional integration arrangements and considers the relevant findings of recent quantitative studies of regional integration arrangements, identifying, as possible, the expected impacts of regional integration agreements on member countries and the world at large. In addition, this paper attempts to derive policy guidelines concerning regional integration arrangements for national economic decision makers and their advisors.

The remainder of the paper is divided into five sections. Section 2 considers the "first principles" of regional integration arrangements as promulgated by Viner (1950) and the subsequent development of a partial equilibrium framework that has come to be closely associated with his name. Section 3 takes up the modern static theory of regional integration arrangements which is based on more models of international trade that allow for greater adjustment of domestic and international terms of trade, and for more explicit and directly derived measures of national economic welfare. Section 4 takes up a number of extensions and special cases of the Vinerian and Meade models that are important in their own right and which have led to the development of particularly complex quantitative economic models. Section 5 examines the findings of recent quantitative studies of the impacts of regional integration arrangements which, in the absence of definitive theoretical results, have come to hold considerable sway in recent discussions and evaluations of regional trading arrangements. Finally, in the concluding section, Section 6 utilizes the guidelines for policy making on regionalism identified in Sections 2-to-4 as a focal point for summarizing the findings of the paper.

Before turning to the main analysis, it should be noted that the paper considers mainly the two most common forms of regional integration arrangements: customs unions and free trade

areas.<sup>3</sup> In a free trade area (FTA), countries enforce discriminatory trade policies by eliminating all tariff and other political barriers to imports that originate wholly or in substantial measure (as determined by so-called rules of origin) within the trading bloc. A customs union (CU), on the other hand, is a free trade area in which member countries also adopt a common set of external tariffs, quantitative restrictions, and other measures to limit imports from outside of the free trade area.<sup>4</sup> Notwithstanding the considerable analytical challenges posed by customs unions and free trade areas, economic analysis of higher orders of economic integration poses still more formidable challenges.<sup>5</sup> Accordingly, in considering the static economic theory and findings of recent quantitative studies of regional integration arrangements, this paper deals principally with the two primary forms of regional integration arrangements treated in the economic literature.

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<sup>3</sup> In addition to free trade in goods (and services), regional economic integration can involve unrestricted movement of labor, capital, or other productive primary resources; and harmonization of sectoral and macroeconomic policies, economic institutions, and even civil and constitutional laws between neighboring countries. These dimensions of regional integration arrangements are usually considered with reference to four (increasing) degrees of economic integration: free (or preferential) trading area, customs union, common market, and economic union.

<sup>4</sup> With regard to the other two major institutional forms of economic integration between countries, a common market is a customs union in which unrestricted movement of labor and possibly other primary factors of production is permitted, and an economic union is a common market in which fiscal, monetary, and other major economic policies (e.g., industrial policies) are harmonized or otherwise closely coordinated. For further discussion, see for instance Robson (1987).

<sup>5</sup> Despite the complexity of higher orders of regional integration, some if not many policy and other conclusions derived from considering only free trade areas and customs unions might still be expected to hold in regard to common markets and economic unions. For instance, in neoclassical economic theory the mobility of labor and other primary resources between countries can be viewed as a perfect substitute for the unrestricted movement of goods between countries (Mundell 1957). Similarly, the harmonization of economywide policies and especially monetary policies might be viewed as providing an "enabling environment," reducing concerns for differences in national monetary and other macroeconomic policies that are not usually considered in the pure (barter exchange) theory of international trade underlying most analyses of free trade areas and customs unions (e.g., Mundell 1961 and O'Connell 1997).

## 2. "First Principles" of Regional Integration Arrangements

The literature on customs unions .... is a strange phenomenon which unites free-traders and protectionists in the field of commercial policy, and its strangeness suggests that there is something peculiar in the apparent economics of customs unions. The customs union problem is entangled in the whole free-trade-protection issue, and it has never yet been properly disentangled.

Viner (1950, p.41)

So begins the celebrated contribution of Viner (1950) to the economic theory of regional integration arrangements. In the quotation, Viner points to the fact that customs unions were a feature of the international economic landscape during (and, in fact, long before) the early post-World War II period, when the two Bretton Woods organizations – the International Monetary Fund and the International Bank for Reconstruction and Development (World Bank) – were first getting underway, and a third international organization, the International Trade Organization, was waiting ratification of its enabling document, the Havana Charter. The quotation also indicates that regional integration arrangements had been investigated by economists before Viner, but without resolution.

Today, nearly 50 years after the Havana Charter was rejected by the United States, the World Trade Organization has been established, finally institutionalizing many of the principles and basic functions that were originally envisioned for the International Trade Organization and supported only partially during the intervening years by the General Agreement on Tariffs and Trade and its interim caretaker, the GATT Secretariat. Also today, major aspects of Viner's seminal analysis of the customs union issue have endured, finding their way into most textbooks on international trade theory and policy.

The enduring Vinerian framework is a highly stylized one, and it bears review here for not only its strengths but also its weaknesses. Viner's original investigation of the customs union issue was devoid of modern-day diagrammatic and mathematical methods of analysis. In this respect, Viner's analysis was "deficient," requiring later development of the "textbook" analysis that bears his name today. Nonetheless, Viner's analysis was extremely rich in insights to some important circumstances still surrounding the customs union issue today, including economies of scale, differentiated products, imperfectly competition, and changes in international terms of trade.<sup>6</sup> Discussion of these circumstances is deferred mainly to subsequent sections of this paper. In the present section, the basic Viner model is introduced and extended to the especially important case of increasing costs of production in member countries, under the maintained assumption that only homogeneous goods (i.e., non-differentiated products) are produced and consumed in both member countries and non-member countries.

### **Basic Viner Model<sup>7</sup>**

The basic Viner model provides a partial equilibrium framework for considering the effects of customs unions. The framework consists of economic relationships depicting demand, supply,

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<sup>6</sup> Viner is duly credited with raising substantive questions about the welfare effects of customs unions, which were widely believed to be positive following World War II (not unlike today). However, the rather strident tone of his final rejection of regional integration arrangements on mainly political-economy grounds, found in the concluding paragraph of his volume on the customs union issue, is not often reported:

...[I]f one looks only to the day, an apparently promising path to a solution can often be found whose first stages, if token in character, are fairly easy to pursue and whose last stages are pleasant to contemplate, though what is at its ultimate end is but a mirage. This, I fear, is the present-day role of customs union. ... [I]t will almost inevitably operate as a psychological barrier to the realization of the more desirable but less desired objectives of the Havana Charter—the balanced multilateral reduction of trade barriers on a non-discriminatory basis. (Viner 1950, p. 139)

<sup>7</sup> The discussion of the Vinerian framework here draws importantly on Robson (1987), Pomfret (1988), and Bhagwati and Panagariya (1996).

and trade in homogeneous goods (for final consumption) by three representative countries: the home country (H), a partner member country (P), and a non-member country (N) representing the rest of the world.

Most important, in addition to a number of "orthodox" (but not inconsequential) assumptions shared with the pure theory of international trade,<sup>8</sup> the basic Viner model assumes that, although import-competing goods may be produced under increasing (marginal) cost conditions, exportable goods are produced under constant cost conditions in each country. In Figure 1, the non-member country is assumed to be the most efficient producer of good 1, which is imported by the home country after levying a specific tariff,  $T_H^1$ . Similarly, the home country is assumed to be the most efficient producer of good 2, which is imported by the partner country after levying a specific tariff,  $T_P^2$ .

Under a customs union (or free trade area) between the home country and partner country,<sup>9</sup> the home country reduces its tariff on imports of good 1 from the partner country to

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<sup>8</sup> As enumerated by Robson (1987), in addition to the homogeneous goods assumption, these assumptions include:

- pure competition in commodity and factor markets;
- mobility of factors of production within but not between countries;
- no transportation costs;
- trade restrictions only in the form of specific or ad valorem tariffs;
- opportunity costs of production fully reflected in prices;
- balanced trade in goods; and
- full employment of resources.

<sup>9</sup> Customs unions and free trade areas are assumed mostly equivalent throughout much of the analysis of this paper. As mentioned in the introduction, countries forming a free trade area eliminate tariffs and other restrictions to intra-bloc trade, but they do not necessarily adopt a common external tariff system as do countries forming a customs union. To avoid trade "deflection," whereby exports by countries outside the free trade area to countries that are members of the free trade area might be re-routed through member countries with lower-tariff levels, free trade areas generally enforce "rules of origin" that stipulate the extent of intra-bloc content or processing that goods must possess in order to qualify for duty-free importation by member countries. However, as noted by, among others, Bhagwati and Panagariya (1996), rules of origin do not prohibit diversion of domestically produced goods in countries forming a free trade area, in which case differing external tariff rates under a free trade area can lead to little or substantially different results than under a customs union, depending upon the variance of external tariff rates and capacity of member countries in a free trade area to divert their output of exportables from domestic markets to markets in other member countries.

zero, providing would-be exporters of good 1 in the partner country with a "margin of preference" sufficient to overcome their cost disadvantage vis-a-vis more efficient producers in the non-member country.<sup>10</sup> This causes exports from the partner country to supplant exports of good 1 from the non-member country to the home country entirely. The replacement of erstwhile exports from efficient producers in non-member countries by exports from less efficient producers in member countries is termed *trade diversion*. In Figure 1(a), trade diversion resulting from the regional integration arrangement is equal to the entire initial value of imports of good 1 (evaluated at the border price  $P_N^1$ ) by the home country from country N, area (k).<sup>11</sup>

The customs union may also give rise to *trade creation*. Trade creation corresponds to the expansion of home country imports of good 1 (evaluated at the border price  $P_P^1$ ) by the area  $[(e+j) + (g+l)]$ . In economic terms, trade creation involves the substitution in both home country production and home country consumption of lower-priced units of good 1 produced by country P than were previously available to the home country through domestic production [area (e+j)] or imports from the rest of the world [area (g+l)].

In Figure 1(b), the hypothesized customs union has qualitatively different effects on trade of the partner country. Because the home country is the least-cost producer of good 2, elimination of the partner country's tariff on imports of good 2 from the home country results solely in trade creation. No diversion of erstwhile exports from non-member countries occurs in connection with the increase in imports by the partner country. Moreover, the expansion of exports of good 2 from the home country to the partner country gives rise solely of substitution in production and consumption in country P of lower-cost units of good 2 produced in the home country than were

<sup>10</sup> With reference to Figure 1, the home country margin of preference in favor of exports of good 1 from the partner country is equal to  $T_H^1 - (P_P^1 - P_N^1)$ .

<sup>11</sup> For ease of exposition, the analysis here is conducted in terms of trade values rather than trade volumes.



available previously to the partner country through domestic production or imports from the non-member country.

Since Viner's seminal analysis, trade creation and diversion have been treated as virtually synonymous with the impact of customs unions and other regional integration arrangements on economic welfare. Accordingly, many empirical and quantitative studies have sought to estimate trade creation and diversion on either an *ex ante* (before the fact) basis or *ex post* (afterwards) basis. To the extent that a regional integration arrangement is trade creating on a net basis (i.e., measured trade creation is greater than measured trade diversion), the arrangement is considered to contribute positively to the combined if not individual welfare of member countries, measured in terms of traditional economic surpluses (so-called Harberger triangles of consumer and producer surpluses) or more sophisticated indices of economic welfare such as Hicksian equivalent variation in income.<sup>12</sup>

Table 1 provides a summary of the effects on trade and economic welfare of the hypothetical customs union considered in Figure 1, for the home country, the partner country, and the customs union formed by the two countries. The changes illustrate that net trade creation is not always unambiguous in sign, as emphasized by Viner (1950). Whereas the customs union results in net trade creation for the partner country in respect to its imports of good 2, the customs union does not necessarily result in net trade creation for the home country in respect to its imports of good 1 or for the custom union as a whole in respect to trade in both goods.<sup>13</sup> These results are "mirrored" in the changes in economic welfare for the two countries. Whereas economic welfare improves unambiguously for the partner country owing to the dominance of

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<sup>12</sup> See, for instance, Harberger (1954, 1971) on the measurement of consumer and producer surplus and Shoven and Whalley (1984, 1992) on the measurement of Hicksian equivalent variation in income.

<sup>13</sup> It is also notable that net trade creation is not necessarily equal to the change in import value for either country.

positive consumption and production effects of trade creation, the change in economic welfare is uncertain for the home country (and customs union) because even though the combined net consumption and production effects related to trade creation and diversion in the home country [area  $(a + b + c)$  in Figure 1(a)] are positive, they might not be sufficiently large in magnitude to be greater than the forgone home country tariff revenues on imports diverted from the non-member country to the partner country [area  $(b + f)$ ].

These results, of course, follow from the assumptions depicted in Figure 1 regarding the relative efficiency of producing exportables in the home country, partner country, and non-member country. For the partner country, the customs union gives rise to trade creation only and greater welfare because the home country is the (assumed) least cost producer of good 2. For the home country, the welfare change is uncertain because the partner country is assumed to be less efficient than the rest of the world in producing good 1. Thus, under assumed constant costs of production, trade with non-member countries is completely diverted, giving rise to forgone tariff revenues that might or might not be larger than the production-related and consumption-related benefits to the home country of a lower import price and increased imports from the partner country. In effect, in a customs union under constant cost conditions, member country gains in economic welfare attributable to trade creation will be partially offset, if not more than fully offset, by added costs of importing goods from high-cost producing countries within the customs union area and forgone tariff revenues. Obversely, in a customs union formed among countries that are predominantly internationally competitive producers of exportables, the regional

integration arrangement will be trade-creating on a net basis and unambiguously welfare-improving.<sup>14</sup>

Quantitative studies of regional integration arrangements have found nearly universally, beginning with ex post empirical studies of the European Community during the 1960s and 1970s and continuing today with mostly ex ante quantitative studies of the many new and "revitalized" free trade areas emerging since 1990, that regional trading blocs are predominantly trade-creating on a net basis. Quantitative "evidence" on welfare gains under regional integration arrangements has traditionally been more sporadic, except in recent years with the advent of sophisticated computable general equilibrium (CGE) models employed in ex ante studies of regional integration arrangements. An early ex post study of trade in manufactures and agriculture under the European Community by Balassa (1975) found that formation of the European Community, including establishment of its strongly trade-diverting Common Agricultural Policy, contributed an economic gain of just 0.3-to-0.4 percent of Community GDP per annum. Recent ex ante studies using multi-country CGE models find similarly modest welfare impacts of regional integration arrangements among "small" less developed countries and advanced countries whose firms are predominantly perfect competitors in domestic and international markets.

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#### Policy Guideline 1

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<sup>14</sup> At this point, the partial equilibrium nature of the basic Vinerian framework begins to strain credulity on some important counts that are developed in the next subsection and Section 3. For instance, comparative advantage theory suggests that neighboring countries are unlikely to be internationally competitive producers of the large number of products consumed by residents of most countries today. This consideration would limit the number of cases in which regional integration arrangements among especially small countries might be predominantly trade creating owing to member countries' international competitiveness in many products. Also, the assumption of unlimited capability to produce exportables at constant unit costs is an extreme one. Moreover, the assumption creates a bias in favor of finding positive trade creation effects under regional integration arrangements. Specifically, the assumption causes erstwhile trade with non-member countries to be supplanted entirely by trade

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Under constant cost conditions, a customs union or free trade area established among "small" countries unable to influence their external terms of trade will be predominantly trade-creating and welfare-improving for the trading bloc and its individual member countries if member countries are predominantly least-cost producers of exportables by international standards. If one or more member countries are inefficient producers of exportables, causing substantial diversion of trade with non-member countries, the inefficient member countries will gain from the regional integration arrangement. Efficient member countries, on the other hand, will not necessarily gain because welfare gains resulting from trade creation might not be sufficient to offset welfare and tariff revenue losses resulting from trade diversion. It is also uncertain in such circumstances whether the trading bloc as a whole will gain.

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Few if any quantitative studies of regional integration arrangements have examined the implications of forgone tariff revenues under regional integration arrangements for the development (or lack of development) of intra-regional compensatory payment schemes. Nonetheless, the importance of forgone tariff revenues under regional integration arrangements in the Vinerian framework needs to be emphasized. Whereas the Harberger *triangles* in Figure 1 measuring economic gains associated with the consumption and production effects of trade creation might be small in many cases, the *rectangles* in Figure 1 representing tariff revenue losses will often be comparatively large. Although tariff revenues are frequently considered transfers between domestic consumers and government (with no net impact on national welfare), reduced tariff revenues under regional integration arrangements are not fully captured by domestic consumers when imports from high-cost member countries replace imports from low-cost non-member countries, as shown in Figure 1(a). Thus, in trade-diverting regional integration arrangements, tariff revenue losses can be decisive in determining the overall welfare effect of the regional integration arrangement on individual member countries and the trading bloc as a whole. In t cases where the formation of a customs union would result in net economic benefits for the

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with member countries at reduced intra-bloc terms of trade, thereby giving rise to positive Harberger welfare

trading bloc, a facility for apportioning tariff revenues among union members might be necessary to enable the countries that gain from formation of the regional integration arrangement to compensate the countries that lose.

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## Policy Guideline 2

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A customs union or free trade area that results in welfare losses for one or more member countries might still be successfully implemented if welfare gains for other member countries are sufficiently large to provide a net welfare gain for the trading bloc as a whole and if a facility for compensatory intra-bloc payments, typically involving apportionment of tariff revenues among member countries, can be successfully implemented such that member countries that gain from the regional integration arrangement compensate member countries that lose.

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In the Vinerian framework, spillover effects of regional integration arrangements on non-member countries do not occur. The customs union or free trade area is assumed to be "small" in terms of its share of world trade. Accordingly, the customs union is a "price-taker" in world markets and unable to affect international terms of trade for goods. In Figure 1, this assumption is represented by the constant price for exportables produced by the non-member country. Consequently, within the stylized Vinerian framework, the economic welfare of non-member countries is unaffected by the formation of a regional integration arrangement, and the change in world economic welfare is identical to the aggregate change in welfare of countries in the preferential trading arrangement. Thus, if the contribution of the customs union to economic welfare in the trading bloc is uncertain, the contribution of the customs union to world economic welfare is also uncertain.

The uncertainty of welfare effects under regional integration arrangements contrast sharply with the certainty of welfare effects under MFN liberalization (i.e., non-discriminatory trade liberalization). As evaluated in Table 1 (based on Figure 1), concerted MFN liberalization by the would-be members of the customs union is everywhere trade-creating and nowhere trade-diverting. That is, MFN liberalization results in net trade creation and improved economic welfare everywhere, including for each would-be customs union member. Consider, for instance, the

home country in Figure 1. Under a customs union, the home country's trade with non-member countries would be diverted in some if not substantial measure. On the other hand, under MFN liberalization consumers increase their consumption of traded goods guided solely by nondiscriminatory price considerations, eliminating the possibility of trade diversion. Thus, under MFN liberalization consumers would be expected to increase their purchases of goods produced in not only prospective member countries but also non-member countries, fully reaping the potential consumption gains [area (c+g+h) in Figure 1(a) and (b)] and resource allocation gains [area (a+d+e)] in both the home country and the partner country.

### **Viner Model with Increasing Costs of Production**

The Viner model can be extended to consider the important case of increasing costs of producing exportables in the countries forming a customs union, as illustrated in Figure 2. The case of increasing costs of production is appropriate to the circumstances of individual countries and small groups of countries whose natural resource base and other productive endowments are typically limited, especially in comparison to the world economy at large. The earlier assumption that unit costs of production are constant in the non-member country is maintained, enforcing the condition that the home country and the partner country are both price-takers in world markets.<sup>15</sup> Finally, for ease of exposition, the analysis here considers only the home country's imports of goods 1, as if formation of a customs union between the home country and partner country would result only in expanded imports of good 1 from the partner country by the home country.

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<sup>15</sup> For ease of analysis and exposition, the partner country is assumed to have no domestic demand for good 1, and therefore in Figure 2 the partner country's supply schedule for good 1 is also the partner country's export supply schedule for good 1.

As before, a customs union between the home country and partner country gives rise to trade diversion in the home country, area  $(e + f)$ . However, it does not necessarily give rise to trade creation because the partner country's margin of preference does not necessarily result in a lower price for good 1 in the home country. Indeed, so long as the partner country's capacity to increase exports is less than the home country's initial total demand for imports of good 1, the home country will continue to import good 1 from the non-member country (country N) and the equilibrium price of good 1 in the home country will remain unchanged at  $P_H^1$  (equal to  $P_N^1$  plus the specific tariff of the home country,  $T_H^1$ ).

That trade with non-member countries is not entirely diverted in Figure 2 occurs because total capacity to produce good 1 in the customs union area is insufficient to meet total demand for the good at any price less than the pre-customs-union price,  $P_H^1$ . This seems an appropriate assumption for many low-income developing countries forming a regional integration arrangement. It is also arguably an appropriate assumption for advanced countries. Production capabilities of advanced countries may be greater than those of less developed countries, but they still might not be sufficient to satisfy intra-bloc demands for tradables entirely and to result in complete cessation of trade with non-member countries as predicted by the Viner model under constant cost conditions (and assumed homogeneous goods).

The trade and welfare effects of forming a customs union between the home country and partner country under the increasing cost conditions shown in Figure 2 are summarized in Table 2. From the home country's perspective, the customs union is trade-diverting on a net basis, and the customs union has no impact on the economic welfare of either individual producers or individual consumers. Because exports of good 1 by the partner country are insufficient to meet fully the home country's demand for imports under a regional integration arrangement, the price



of good 1 in the home country is unchanged and, accordingly, both demand and production of good 1 in the home country are also unchanged. The improved competitiveness of producers of good 1 in the partner country simply goes to diverting a portion of the home country's imports of good 1 from non-member countries.

Overall economic welfare in the home country is adversely affected however. In extending a tariff preference to the partner country, the home country gives up previously collected tariff revenues on both initial imports and "new" imports from the partner country [area  $[1+m+2(a+b)]$  in Figure 2]. The forgone tariff revenues are "captured" in their entirety by producers of good 1 in the partner country, at a *comparatively* small resource cost [area  $(a+b)$ ]. Thus, the home country loses, and the partner country gains from formation of the customs union. Moreover, as pointed out by Bhagwati and Panagariya (1996) and Schiff (1996) with respect to the case of "natural" trading partners, the forgone tariff revenues of the home country and the welfare gain of the partner country are greater, the greater is the initial volume of trade between the home country and partner country (so long as the non-member country initially supplies an appreciable volume of imports to the home country, as depicted in Figure 2).

Finally, the customs union and the world economy both lose from formation of the hypothetical customs union in Figure 2. Specifically, welfare of the trading bloc and, by extension, welfare of the world economy are reduced by the incremental cost of the resources utilized to expand production of good 1 at higher cost in the partner country than the non-member country [area  $(a+b)$ ].<sup>16</sup>

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<sup>16</sup> Notwithstanding that the customs union and world economy lose from formation of the custom union under the increasing costs depicted in Figure 2, the direct impact of the formation of the customs union on private economic surplus is either neutral (home country) or positive (partner country). The losses to the home country, the customs union, and the world economy, respectively, hinge crucially on the disposition of tariff revenues. Although it is generally assumed that tariff revenue gains and losses are shared through lump-sum transfers by the government to

Are regional integration arrangements pursued by relatively open economies more likely to be trade-creating, as sometimes claimed? Bhagwati and Panagariya (1996) demonstrate that the answer to this question is no. Under high protection in the home country (and therefore substantially smaller volume of initial imports by the home country than depicted in Figure 2), a regional integration arrangement between the home country and partner country might well result in a lower price for imports in the home country and complete cessation of trade between the home country and non-member country. In this circumstance, net trade creation might occur, and the home country might achieve welfare gains similar to those found under constant costs of production. In contrast, under a relatively open trading regime in the home country, such as depicted in Figure 2, a regional integration arrangement between the home country and partner country will not result in a lower price for imports in the home country, nor will imports from non-member countries be completely diverted. In fact, under increasing cost conditions in the Viner model, a relatively open trading regime will tend to ensure that a regional integration arrangement will be trade diverting on a net basis and that welfare of the home country, trading bloc, and world economy will decline, as summarized in Table 2.

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### Policy Guideline 3

Under increasing costs conditions, a customs union or free trade area established among small countries unable to influence their external terms of trade will be predominantly trade diverting so long as non-member countries continue to supply imports to member countries. Although member country producers whose exports to other member countries are increased under the regional integration arrangement will enjoy welfare gains, the welfare of member countries will typically decline because they give up substantial tariff revenues and enjoy no overall increase in their imports. Welfare of the trading bloc and (equivalently) the world economy will also typically decline, owing to the greater resources necessary to expand exports by member countries than

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consumers, such transfers may be heavily discounted by consumers in the modern age of large government bureaucracies and deficit spending, in which case private sector support for regional integration arrangements might be stronger than otherwise.

necessary to supply the same exports by non-member countries. The certainty of welfare losses occurring under increasing cost conditions is greater, the less highly protectionist are, initially, the countries forming the regional integration arrangement.

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The implications of highly protected economies versus more open economies forming a regional integration arrangement have not been specifically explored in recent quantitative studies of regional integration arrangements. Also, notwithstanding the increasing use of multi-country CGE models to investigate the possible effects of customs unions and free trade areas, few quantitative studies have purposely considered the global trade and welfare effects of increasing regionalism among less developed countries if not advanced countries. Most recent quantitative studies either fall back on the maintained assumption of the Viner model (and "small union" Meade model discussed in the next section) that countries forming a regional integration arrangement have little or no power to influence international terms of trade for goods (and services) or volume of world trade significantly, or they simply provide little indication of what the estimated or simulated spillover effects of recent regional integration arrangements on the greater world economy are.

Finally, it is again interesting to consider the comparable trade and welfare effects of concerted MFN trade liberalization, also summarized in Table 2. As found in the case of constant production costs, MFN trade liberalization under increasing costs of production in the customs union results solely in trade creation in the home country.<sup>17</sup> Also again, trade creation has its counterparts in both production and consumption effects, and, notwithstanding forgone tariff revenues, MFN liberalization results in a net welfare gain for the home country. This welfare gain derives from the improved allocation of domestic resources [area (a+k+m) in Figure 2] and increased consumption possibilities [area d]. Moreover, because the partner country is unaffected

by nondiscriminatory trade liberalization in the home country, both the customs union and world economy at large gain from unilateral trade liberalization in the home country, namely, by the total amount of the welfare gain in the home country [area  $(a+k+m+d)$ ].

Two recent ex ante studies of the new free trade area among the Association of Southeast Asian Nations (Asean), the Asean Free Trade Area (Afta), by DeRosa (1995) and by Lewis and Robinson (1996) provide basic support for the dominance of (concerted) MFN trade liberalization over preferential regional trade liberalization, albeit using CGE models that represent the Asean economies in considerably more complex terms than depicted in Figure 2. Both studies find that the predominantly middle-income countries of Southeast Asia (the so-called Asean-4: Indonesia, Malaysia, Philippines, and Thailand) gain significantly more in terms of improved welfare from simultaneously liberalizing their trade regimes on a nondiscriminatory basis (MFN liberalization) than on a discriminatory basis (Afta). For instance, DeRosa finds that whereas economic welfare (measured by real absorption) in the Asean-4 improves typically by less than about 0.5 percent under Afta, it improves by more than 4.0 percent under concerted MFN liberalization.

### **3. Modern Static Theory of Regional Integration Arrangements**

The Viner model and its framework for analyzing regional integration arrangements do not lie comfortably within the bounds of modern neoclassical trade theory, whose boundaries are defined fundamentally by general equilibrium theory and its emphasis on interrelationships among markets for goods and factors of production throughout an economy. Moreover, regionalism in the world economy today involves not only "small" blocs of countries but also "large" blocs of countries that count potentially for an appreciable share of world trade. Therefore, in principle, a

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<sup>17</sup> Production and exports of good 1 by the partner country are unchanged because the effective world price of good

more general framework for considering the static economic effects of regional integration arrangements is desirable, namely, a framework admitting substitution of goods in demand and supply, simultaneous adjustment of interrelated markets for goods and factors of production in trading countries, and possible international terms of trade effects impinging significantly on trade and economic welfare in individual countries and the world at large.

### **Meade and the Theory of Second Best**

In a less widely recognized volume on the theory of customs unions than Viner's contribution, Meade (1955) outlined if not fully developed the modern static theory of regional integration arrangements.<sup>18</sup> Meade's analytical framework explicitly admitted trade by many countries in many commodities. Reflecting the "culture" of the day, Meade relied upon macroeconomic policies to ensure full equilibrium (including equilibrium in international payment balances). However, his framework pointed clearly to the central role of prices and international terms of trade for achieving and maintaining equilibrium in international trade and payments under preferential trading arrangements. Finally, Meade focused his analysis on the economic welfare of the world economy, not simply the countries forming a regional integration arrangement. In going beyond the "small country" perspective of the Vinerian framework, he recognized the potential for significant secondary effects of regional integration arrangements on third-countries and the world economy at large owing to adjustment in world markets for traded (and nontraded) goods.

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1 is unaffected by MFN trade liberalization in the home country, as shown in Figure 2.

<sup>18</sup> For a recent and thoroughgoing discussion of Meade's theory of customs union, see Panagariya (1996). Notably, notwithstanding the title of his volume, Meade did not analyze the implications of customs unions *per se* but rather the broader class of preferential trading arrangements which do not necessarily stipulate the adoption of common external tariffs or other import control measures.

Meade's volume also lent considerable inspiration to the development of the so-called theory of second-best (Lipsey and Lancaster 1956/57). The theory of second-best holds that for distorted economic systems, eliminating one set of distortions does not guarantee an improvement in overall economic welfare so long as other economic distortions remain unchanged. As it applies to the static theory of regional integration arrangements, the theory of second-best implies that reducing tariffs on a discriminatory basis under a regional integration arrangement (and so seemingly moving in the direction of Pareto optimality) does not guarantee an improvement in welfare for individual countries or the world economy, as maintained originally by Viner (1950).<sup>19</sup> Accordingly, the numerous circumstances surrounding individual regional integration arrangements in the Meade tradition of general equilibrium analysis matter importantly for whether the arrangements are welfare-enhancing. Moreover, they make generalizations regarding the economic benefits of customs unions and free trade areas extremely difficult.

### **The Meade Model**

Meade abandoned the Vinerian assumption of constant costs of production in trading countries and recognized the necessity of ensuring equilibrium in international payments balances. Thus, Meade brought to the fore adjustment in both international and domestic relative prices to achieve (general) equilibrium under regional integration arrangements. These refinements to the static theory of regionalism admit the possibility of not only spillover effects of regional integration arrangements on non-member countries but also feedback effects of international

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<sup>19</sup> More generally, unilateral trade liberalization by an individual country may not be welfare-improving if the country is sufficiently "large" or other trading countries are sufficiently highly protected to cause the individual country's terms of trade to deteriorate as it reduces its trade barriers unilaterally and expands its exports to maintain balance of payments equilibrium.

adjustments to the formation of regional integration arrangements on member countries themselves.

### **Basic Small Union Model**

Meade's general or "large union" model is not easily represented in textbook or policy discussions. More widely considered is the "small union" Meade model in which the conditions for international payments equilibrium by member countries are observed under increasing cost conditions in all sectors but in which the international terms of trade are assumed constant.

Figure 3 illustrates the basic small union model for two small countries that form a preferential trading arrangement and trade in only two goods (goods 1 and 2).<sup>20</sup> The schedules depicted in Figure 3 are general equilibrium trade offer curves rather than partial equilibrium demand and supply schedules. The offer curves,  $O_H$  and  $O_P$ , indicate the volume of exports that the home country and the partner country are respectively willing to exchange for imports under very general demand and supply conditions in both countries at different international terms of trade, while maintaining balance of payments equilibrium. Initially, the two countries are assumed to enforce substantial tariffs against imports, and to trade "short" of their free-trade offer curves, at points  $E_{HN}^0$  and  $E_{PN}^0$ , respectively, along the ray  $O_N$  that represents the offer curve of the non-member country (representing, again, the rest of the world). That the slope of  $O_N$  is constant reflects the fact that the international terms of trade for goods 1 and 2 are not affected by the volume of trade by either the home country or partner country.

Under a customs union or free trade area in which external tariffs and other trade restrictions are sufficiently high that the home country and the partner country trade exclusively

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<sup>20</sup> Figure 3 and the discussion of the figure in the text are adapted from Pomfret (1988).

with one another (i.e., the regional integration arrangement is completely trade-diverting), the trade and intra-bloc payments equilibrium for the two countries occurs at point  $E_{HP}$ . This equilibrium determines the domestic and intra-bloc terms of trade for members of the regional integration arrangement given by the dashed line in Figure 3. From the perspective of the partner country, the equilibrium at  $E_{HP}$  is superior to equilibrium under either protection or free-trade.<sup>21</sup> However, from the perspective of the home country, the equilibrium at  $E_{HP}$  is inferior to equilibrium under protection or free trade. First, the home country's "income terms of trade" (i.e., the international terms of trade multiplied by the country's export volume) are lower, and, consequently, its volume of imports is lower, under the regional integration arrangement than under protection. And second, as is apparent in Figure 3, under free trade rather than the regional integration arrangement, the home country could admit a greater volume of imports from all countries on a duty-free basis and, in so doing, expand its exports along the more favorable international terms of trade,  $O_N$ , offered by the non-member country until equilibrium is reached at point  $E_{HN}$ , corresponding to a higher level of welfare than a point  $E_{HP}$ .

Thus, in the small union Meade model the distribution of economic gains among member countries in a regional integration agreement is extremely important for the stability of the agreement. In fact, in the simple two-good model underlying the trade offer-schedules in Figure 3, one member country always loses from formation of a regional integration arrangement, relative to the pre-integration circumstances of the member countries or to the opportunities for member countries to improve their trade and welfare under unilateral nondiscriminatory trade

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<sup>21</sup> If the partner country liberalizes its imports on a nondiscriminatory basis, its new trade equilibrium would occur at point  $E_{PN}$ . Figure 3 shows that the free trade equilibrium for the partner country is superior to the initial equilibrium at  $E_{PN}^0$ , but it is inferior to the equilibrium under the regional integration arrangement at  $E_{HP}$ . Thus, the partner country should be expected to prefer joining the regional integration arrangement depicted in Figure 3 to undertaking unilateral nondiscriminatory tariff reduction.



liberalization. Again, as in the Vinerian analytical framework, compensatory schemes involving lump-sum or other transfers between member countries would be necessary to ensure that all member countries benefit from a regional integration arrangement. Also, from the welfare changes for the home and partner country depicted in Figure 3, it is not clear that the trading bloc as a whole necessarily gains from the regional integration arrangement.<sup>22</sup>

Finally, with regard to welfare in the rest of the world, in Figure 3 the assumption of a perfectly elastic trade offer curve for the rest of the world implies that, even though trade between member countries and non-member countries ceases completely under the regional integration arrangement,<sup>23</sup> global spillover effects of the regional integration arrangement are negligible, not unlike in the Vinerian framework.

In the discussion here, the welfare benefits of the regional integration arrangement are considered mainly in terms of underlying community preferences for traded goods, without necessary reference to the Vinerian notions of trade creation or diversion. This means of evaluating regional trading arrangements is in keeping with modern international trade theory, as discussed by Kowalczyk (1990), and with recent ex ante quantitative studies of regional integration arrangements (considered in Section 5).

### **Small Union Model with Incomplete Trade Diversion**

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<sup>22</sup> In Figure 3, if protection in the home country and partner country is so high as to restrict imports to near-autarkic levels initially, then a regional integration agreement between the two countries will be unambiguously welfare-improving for both countries.

<sup>23</sup> In Figure 3, the home country and the partner country trade exclusively with one another under a regional integration arrangement. Illustrations of customs unions and free trade areas admitting incomplete diversion of trade between member countries and non-member countries in the small union Meade model are considered in the next sub-section.

Direction of trade data for members of regional integration arrangements indicate that trade with non-member countries does not cease after regional integration arrangements are formed, contrary to the outcome in Figure 3 and similar analyses using the basic small union Meade model (e.g., Wonnacott and Wonnacott 1981). This direction of trade evidence may reflect the existence of traded goods that are differentiated by their place of production (discussed in Section 4). However, incomplete trade diversion under regional integration arrangements is also a possible outcome in the small union Meade model assuming trade in homogeneous goods.

**Customs Union.** Unfortunately, when trade continues with non-member countries under a customs union, diagrammatic analysis becomes more complicated. For the exposition here, assume that a customs union sets its common external tariff equal to the average tariff level of the home country and partner country. This case conforms importantly to GATT Article XXIV which stipulates that a regional integration arrangement should not raise the average level of protection against non-member countries.

In the depiction of this case in Figure 4, the home country and the partner country both continue to trade along the international terms of trade  $O_N$ . Because the initial level of import tariffs is assumed higher in the home country than the partner country, equilibrium of the home country under the customs union occurs at a point such as  $E_{HN}'$  (closer to the free-trade equilibrium at  $E_{HN}$ ), where economic welfare in the home country is greater than at the initial equilibrium of the home country at  $E_{HN}^0$ . At the same time, equilibrium of the partner country under the customs union occurs at a point such as  $E_{PN}'$  (further away from the free-trade equilibrium at  $E_{PN}$ ), where economic welfare in the partner country is less than at the initial equilibrium of the partner country at  $E_{PN}^0$ .

Thus, not (qualitatively) unlike the outcome in Figure 3 using the basic small union Meade model, the home country gains while the partner country loses from the formation of the customs union. Unfortunately, it is not clear from Figure 4 whether the home country might compensate the partner country for its loss and thereby ensure formation of the regional integration arrangement. However, it would not be difficult to demonstrate that, if the two countries adopt a common external tariff much closer to the initially lower tariff level of the partner country, the welfare gain of the home country would become sufficiently larger than the welfare loss of the partner country to guarantee existence of a compensatory scheme whereby the home country could more than compensate the partner country for any welfare loss associated with formation of the customs union.

**Free Trade Area.** With continued trade between member countries and non-member countries, a free trade area is subject to a number of possible outcomes in the small union Meade model, depending upon the commodity composition of trade between member countries and non-member countries after the free trade area is formed.<sup>24</sup> If the assumption here is maintained, both before and after the free trade area is formed, that on a combined basis the home country and the partner country are net exporters of the first commodity and net importers of the second commodity, then under the free trade area the protection levels and domestic relative prices of the home country will prevail in both member countries of the regional integration arrangement. As depicted in Figure 5, the partner country will benefit from the opportunity to trade exclusively with the home country at the higher (to the partner country) intra-bloc terms of trade  $(P_1/P_2)_{HH}$ . However, it is likely that the home country will suffer a loss in economic welfare because under the free trade area, after account is taken of the home country's duty-free trade with the partner

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<sup>24</sup> See Kemp (1969) for a comprehensive treatment of possible outcomes under different assumptions.

country, the home country can only exchange a smaller proportion of its exports of good 1 for imports of good 2 at the more favorable international terms of trade  $O_N$ . Thus, as found previously in the case of a customs union with incomplete trade diversion, it is not clear that the home country and the partner country will both benefit from a free trade area, or that either country will gain sufficiently to compensate the other country for its possible economic loss under the free trade area.

In both its basic form and more complex forms, including variants that assume trade in three goods,<sup>25</sup> the small union Meade model has been widely studied. Among the most widely cited analytical results of the small union model, initially reported by Meade (1955, p.35) himself, is the result that if a country entering into a regional integration agreement increases its imports from all sources (including non-member countries), the country will enjoy an improvement in its economic welfare.<sup>26</sup> This result is appealing and sensible, including in terms of Viner's concept of net trade creation. However, from a policy perspective, it provides little insight into what circumstances or conditions surrounding countries forming a regional integration agreement might

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<sup>25</sup> In the three-country, three-good variant of the small union Meade model, it is typically assumed that the home country and partner country specialize in the production of one good each, while the non-member country produces all three goods. Under restrictive assumptions regarding the degree of substitutability of the three goods in demand, all three countries may produce the three goods without sacrificing some of the interesting analytical results found using the simpler three-country, three-good variant of the small union Meade model. See McMillan and McCann (1981) and Panagariya (1996).

<sup>26</sup> For further discussion, see Lipsey (1970), Baldwin and Venables (1995) and Panagariya (1996). Lipsey (1970) reports three other interesting results based on the small union Meade model:

1. A regional integration arrangement that reduces the tariff on the partner country's good is more likely to be beneficial than the arrangement that removes the tariff entirely;
2. A regional integration arrangement is more likely to raise welfare the higher is the level of tariff on the partner country initially in relation to the tariff on the non-member country; and
3. A necessary condition for preferential liberalization to improve a country's welfare is that it lower the country's expenditure on its domestic good thereby increasing the volume of imports, both measured at world prices.

guarantee that the arrangement would result in an expansion of the trade of member countries from all sources. Moreover, most quantitative studies find that regional integration arrangements result in at least some diversion of trade with non-member countries. Thus, it is frequently recommended that countries forming a preferential trading arrangement should simultaneously lower their external barriers to trade so that their imports from all trading partners will increase and the impact of the arrangement on regional economic welfare and world economic welfare will both be positive.

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#### Policy Guideline 4

In a general equilibrium setting under increasing cost conditions in both member and non-member countries, a customs union or free trade area established among countries unable to influence their external terms of trade individually or as a trading bloc will be welfare-improving for individual member countries and the trading bloc if the regional integration arrangement increases imports by member countries from all trading partners. To ensure this outcome, member countries of a new trading bloc should simultaneously reduce their barriers to trade with non-member countries. Barring this strategy, a regional integration arrangement formed by a relatively small number of countries will result in at least one member country being made better off and the possibility of one or more member countries being made worse off, raising the advisability of establishing a facility for compensatory intra-bloc payments to ensure that all member countries enjoy economic gains when the trading bloc as a whole is welfare-improving.

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#### **Large Union Model**

The large union Meade model encompasses possible global spillover effects of regional integration arrangements operating through not only diversion of trade but also changes in international terms of trade. It is also appropriate for assessing the avowed objective of many regional integration arrangements to defend and, as possible, improve member countries'

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See Panagariya (1996) for further discussion and the derivation of these results in terms of a compact version of the

international terms of trade in response to new or reinvigorated regional integration arrangements in other areas of the world.

Unfortunately, the large union Meade model has not been fully explored by modern-day economic theoreticians.<sup>27</sup> Broadly speaking, the large union Meade model poses analytical and policy issues similar to those associated with the optimal tariff issue for individual countries. In this connection, changes in intra-regional and extra-regional trade may have significant impacts on international prices for traded goods impinging on the economic welfare of both member countries and non-member countries. If either the volume of non-member countries' exports or their international terms of trade are adversely affected by a regional integration arrangement, then the welfare of non-member countries and possibly the welfare of the world economy might be significantly repressed.<sup>28</sup>

This possibility, which has been discussed in the context of large blocs of not only advanced countries but also large blocs of less developed countries with potential market power, is among the most prominent issues surrounding regionalism today. Based on early insights by Meade (1955, p. 98), Ohyama (1972) and Kemp and Wan (1976) offer an interesting theoretical perspective on this issue. In what is popularly termed the Kemp-Wan theorem, these economic theoreticians proved that for any proposed customs union or free trade area there exists a set of common external tariffs that would precisely leave the new trading bloc's trade with non-member countries unchanged, so that the welfare of the latter countries would not be affected and any improvement to the welfare of the integrating countries would strictly add to world welfare.

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small union Meade model.

<sup>27</sup> For an early analysis of the welfare implications of customs unions under endogenous international terms of trade, see Mundell (1964).

Despite its elegance, the Kemp-Wan theorem has not proven to be operationally relevant to date. Recently, Srinivasan (1996) usefully derived an operational "characterization" of the Kemp-Wan common external tariff structure for a customs union, namely, as a consumption-weighted average of pre-union tariffs and subsidies in member countries. Notwithstanding this seemingly practical development, there remains the political-economy problem of reaching a consensus in favor of establishing such a common external tariff structure, inclusive of possibly requisite lump-sum transfers to ensure all member countries share in the welfare gain of the customs union or free trade area.<sup>29</sup>

The Kemp-Wan theorem has occasionally been invoked as a "test" of the desirability of existing regional integration arrangements. Specifically, some analysts have suggested that if a regional integration arrangement promotes exports from non-member countries to the members of the trading arrangement, the arrangement must improve the welfare of non-member countries and the world economy as a whole. Richardson (1995) and Winters (1997) have both objected to such interpretations of the Kemp-Wan theorem.

Richardson argues that in a world in which countries behave optimally, any attempt by members of a customs union to set their common external tariffs in a manner to guarantee that no non-member country is harmed by the union would likely be met by retaliatory tariff adjustments by non-member countries that would leave members of the customs union (as a bloc) no better off and possibly worse off than before.

Winters demonstrates that increased exports by non-member countries to member countries under a regional integration arrangement is an inappropriate application of the Kemp-

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<sup>28</sup> Feedback effects of international terms of trade changes on the welfare of individual member countries would be mainly positive or mainly negative accordingly as the member countries are net exporters or net importers, respectively, of commodities whose terms of trade increase in international markets.

Wan theorem. This follows because the welfare of non-member countries is not monotonically related to their exports to member countries. Essentially, the welfare impacts of a regional integration arrangement on non-member countries must be estimated more directly, for instance, on the basis of changes in imports by non-member countries (and changes in their terms of trade), because residents of non-member countries, like residents of other countries, fundamentally derive enjoyment from consuming rather than producing goods.<sup>30</sup>

#### 4. Extensions and Special Cases

The large union Meade model does not yield ready guidelines on regional integration arrangements for policy makers owing to both the difficulty of deriving analytical solutions to the model and the problem of making generalizations about policy options that fall within the particularly wide bounds of the theory of second-best. For these reasons, economists have been drawn to a process of identifying special cases and circumstances that are more amenable to solution in general equilibrium models, and more amenable to deriving clear insights or policy prescriptions to issues surrounding regional integration arrangements.

This section discusses some prominent extensions and special cases of not only the Meade model but also the Viner model, with a view to identifying and delineating additional policy guidelines that emanate from the static theory of regional integration arrangements. As in Sections 2 and 3, unless otherwise stated, most orthodox assumptions underlying the pure theory of international trade are maintained, including especially the assumptions of perfect competition and production and consumption of homogeneous traded goods.

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<sup>29</sup> For further discussion, see, for instance, Bhagwati (1992).



### Country Size and "Natural" Trading Partners

The economic size of countries joining a regional integration arrangement has been of considerable interest to economists recently (e.g., Bhagwati and Panagariya 1996; Schiff 1996). Principally at issue is whether a small country can expect to gain more from joining a large regional integration arrangement than a small regional integration arrangement.

A related issue is whether trading countries that have a mutual affinity for trade with one another (so-called natural trading partners), owing, for instance, to strong complementarity of resource endowments or geographic proximity, should expect to gain more substantially from forming a regional integration arrangement than other countries, as maintained recently by some prominent policy makers and special reports on regionalism.<sup>31</sup>

Being a small country unable to influence the terms of trade of would-be partner countries in a regional integration agreement can be a distinct advantage. Schiff (1996) finds that a small country joining a large regional trading arrangement is likely to gain in a similar manner to a small country liberalizing its trade on a unilateral MFN basis. By reducing tariffs on imports from member countries of a trading bloc that is sufficiently large to satisfy a small country's entire import demands at little or no increase above the prevailing international terms of trade, a small country will unambiguously increase its welfare, specifically, through welfare-improving combinations of increased consumption of low cost imports, reduced production of high cost domestic substitutes, and reduced consumption of imports from inefficient "small" third-countries. Moreover, Schiff finds that the smaller the initial level of trade with the large trading bloc, the

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<sup>30</sup> A similar difficulty can arise in connection with attempting to assess the welfare impacts of a regional integration arrangement on member countries using solely net trade creation as an indicator. See, for instance, Kowalczyk (1990).

greater will be the welfare gain for the small country because of the greater margin for substitution in demand by the small country away from high cost goods produced domestically or high cost goods imported from third-countries, to lower cost goods imported from efficient countries in the large trading bloc.

Conversely, if a small country joins a small regional integration arrangement that is unable to meet its total demand for imports except at substantially higher border prices, so that consumers in the country must continue to purchase imports from third-countries at a high price (namely, the international terms of trade adjusted for the import tariff originally levied on an MFN basis), then not only the small country but also the regional trading bloc as a whole will be worse off as a consequence of accession of the small country to the small regional integration arrangement. Analogous to the outcome in the Viner model under increasing costs of production, the small country will be worse off by the amount of its forgone tariff revenues on imports from member countries in the small regional integration arrangement, and the trading bloc as a whole will be worse off by the amount of resources in member countries devoted to expanding exports to the small country (see Table 2).

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#### Policy Guideline 5

Under increasing cost conditions, a small country unable to affect its international terms of trade will increase its welfare by joining a "large" regional integration arrangement whose intra-bloc relative prices will not be affected by accession of a small country to the arrangement. Conversely, a small country will reduce its welfare by joining a "small" regional integration arrangement that cannot supply a greater volume of imports to the small country except at higher intra-bloc prices, in which case welfare of the trading bloc itself will also be reduced.

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<sup>31</sup> See, for instance, Summers (1991) and EU (1995).

With regard to the issue of "natural" trading partners, it has been suggested that neighboring countries or countries whose relative resource endowments are highly complementary – in both cases, giving rise to appreciable initial levels of trade – should be expected to expand their trade relations significantly under a regional integration arrangement and, thereby, derive particularly large benefits from forming a regional trading bloc. However, as reported by Bhagwati and Panagariya (1996) and Schiff (1996), under a regional integration arrangement between natural trading partners, tariff revenue losses ("rectangle" effects) arising because natural trading partners will initially enjoy more extensive mutual trade relations than other countries are likely to be substantial. Moreover, in the event that margins of preference under a regional integration arrangement give rise to welfare gains from positive consumption or production effects ("triangle" effects), the tariff revenue losses are likely to be greater than the production-related and consumption-related welfare gains. Thus, contrary to the natural trading partners hypothesis, economic gains from forming a trading bloc are likely to be smaller, the greater is the initial volume of trade between would-be members of the arrangement for "natural" or other reasons.

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#### Policy Guideline 6

Under increasing cost conditions, "natural" trading partners that are unable to affect their international terms of trade will not experience substantial trade diversion on forming a regional integration arrangement among themselves. However, on forming a regional integration arrangement, natural trading partners will also not enjoy substantial gains in welfare because forgone tariff revenues will be nearly equal to, if not greater than, welfare gains from consumption and production effects.

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## Foreign Trade Barriers and Transport Costs

Among the most enduring issues surrounding regional integration arrangements is why countries choose to form customs unions or free trade areas when most analyses within either the Vinerian framework or the Meade framework suggest that unilateral trade liberalization on a nondiscriminatory basis is usually a superior policy option. Wonnacott and Wonnacott (1981, 1992) provide a possible answer to this question that highlights two real-world obstacles to international trade: foreign trade barriers and transportation costs.

Foreign trade barriers and transport costs both drive a wedge between the price that consumers in importing countries pay and the price producers in exporting countries receive for the same traded goods. The Wonnacotts argue that this wedge might be sufficiently large to offer neighboring countries opportunities for expanding their mutual trade on a preferential basis in a manner that captures the price wedge arising from substantial protection in third-countries or from high transport costs for goods shipped to third-countries. Specifically, with the adoption of a customs union or free trade area, the member countries might be able to trade on more favorable terms exclusively with one another than with highly protected or distant third-countries.<sup>32</sup>

This possibility is illustrated in Figure 6, which is based on the two-good representation of the basic small union Meade model considered earlier. Recall that the offer curve of the non-member country (representing the rest of the world) is given by the ray  $O_N$ , and that the slope of  $O_N$  is the effective international terms of trade facing the home country and partner country in the absence of trade restrictions or transportation costs. Suppose, however, that the home country's exports of good 1 to the non-member country face either a substantial tariff or particularly high

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<sup>32</sup> The Wonnacott and Wonnacott analysis of regional integration arrangements does not consider the possibility of continued extra-bloc trade by member countries seeking to circumvent foreign trade barriers or high trade

transport costs.<sup>33</sup> As suggested by the Wonnacotts, this situation might be the case for, say, German exports of steel to the United States versus the United Kingdom, against the background of the European Union in which Germany and the United Kingdom are both members. Such circumstances would cause the non-member country's offer curve faced by the home country to become  $O_N'$ , with equilibrium for the home country under unilateral nondiscriminatory trade liberalization at  $E_{HN}'$ . The free-trade equilibrium at  $E_{HN}'$  is inferior to the equilibrium under a regional integration arrangement between the home country and partner country at  $E_{HP}$  for two reasons: (1) the regional terms of trade facing the home country,  $(P_1/P_2)_{HP}$ , are greater than the international terms of trade given by the slope of the offer curve  $O_N'$ , and (2) the volume of trade at  $E_{HP}$  is greater than the volume of trade at  $E_{HN}'$ .<sup>34</sup> Thus, in Figure 6 both the home country and the partner country (rather than solely the partner country, as found in discussion of the small union Meade model and Figure 3) prefer a customs union or free trade area to unilateral MFN trade liberalization.<sup>35</sup>

In Figure 6, the home country and partner country exchange trade preferences (giving up tariff revenues on imports from one another) in order to capture the greater savings from the high costs of protection or transport of goods associated with the home country's exports to the non-member country. This is a relevant finding, but one that is contingent upon the real-world occurrence of significant transactions costs for trade with non-member countries.

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transportation costs, in which case prospects for welfare gains under a regional integration arrangement might be reduced.

<sup>33</sup> Solely for ease of exposition, in Figure 6 only the home country is assumed to face high protection and/or high transport costs in connection with its exports to the non-member country.

<sup>34</sup> The partner country also prefers regional free-trade equilibrium at  $E_{HP}$  to the multilateral free-trade equilibrium at  $E_{PN}$  for the same two reasons, namely, the more favorable terms of trade and more favorable trade volume under the regional free-trade equilibrium at  $E_{HP}$ .

<sup>35</sup> As Pomfret (1988) notes, although the home country and partner country both gain, under the regional integration arrangement in Figure 6 the non-member country loses owing to reduced imports and lost tariff

Amjadi and Winters (1997) provide a rare study of this issue that focuses on transportation costs facing exports by member countries of the South American Common Market (Mercosur). They investigate whether transportation costs between Mercosur countries and non-member countries (represented by the United States) are sufficiently high to afford significant gains to Mercosur countries under their new customs union. They find that transportation costs for exports destined for countries outside Mercosur are appreciably higher than intra-regional transportation costs. However, they judge that the margin between the two costs is not sufficiently large to result in a net welfare gain for Mercosur countries.

No recent quantitative studies using multi-country economic models have directly investigated the "missing foreign tariff" hypothesis advanced by the Wonnacotts. Nonetheless, it is implicitly true that, to the extent recent multi-country CGE models incorporate information about levels of protection in not only member countries but also non-member countries, simulations of these models must account in some measure for the benefits of regional integration arrangements attributable to circumventing extra-regional levels of protection. In this connection, an issue for future analysis is whether such benefits are indeed being captured by these models, and, if they are, whether such benefits are contributing appreciably if not critically to the generally positive welfare effects of regional integration arrangements reported by studies using these models.<sup>36</sup>

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#### Policy Guideline 7

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revenues. Thus, the implications for world welfare are uncertain depending upon the relative magnitudes of the welfare gain by the customs union and welfare loss by the non-member country.

<sup>36</sup> As discussed further below in this section and the next section, a complicating factor in interpreting the results of recent quantitative studies vis-a-vis predictions of Vinerian and Meade models is that CGE models employed in recent studies generally assume differentiated goods rather than homogenous goods, introducing possible (but uncertain) biases in the results.

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Under increasing cost conditions, two or more neighboring countries facing substantial foreign trade barriers, transport costs, or other "hindrances" to their exports to third-countries might form a regional integration arrangement that will be welfare-improving to individual member countries and possibly the trading bloc as a whole if the benefits of "capturing" the costs of the hindrances to exports to third-countries through formation of the regional integration arrangement outweigh the tariff revenue losses and other possible welfare costs of forming the trading bloc.

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### **Imperfect Competition, Scale Economies, and Differentiated Goods**

During the last two decades with the advent of the so-called "new trade theory," international trade theoreticians have explored the implications for international trade and welfare of imperfect competition between firms in an increasingly integrated world economy.<sup>37</sup> Under imperfect competition, natural, technological, or policy-based barriers to market entry by firms give rise to monopolistic profits, often in the presence of increasing returns to scale and production of differentiated goods, rather than homogeneous or like goods, by competing firms.

Among the earliest findings of empirical studies of economic integration in Western Europe is that the European Community stimulated trade in similar products (so-called intra-industry trade) rather than trade in complementary products (so-called inter-industry trade), contrary to the prediction of traditional comparative advantage theory in which countries do not both export and import goods produced in the same industry.<sup>38</sup> This finding, which is substantiated by more general studies of price competitiveness in international trade,<sup>39</sup> has led to both theoretical and quantitative studies of regional integration under different assumptions about the competitive structure of markets, scale economies, and product differentiation.

If scale economies can be realized, they offer individual firms valuable opportunities for achieving greater international competitiveness. For high-technology firms in advanced countries, achieving scale economies in the production of new products can limit if not exclude entry by other firms in "thin" or comparatively small-scale markets for new products (e.g., Krugman 1980). For firms in less developed countries, achieving scale economies in the production of

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<sup>37</sup> See Helpman and Krugman (1985) and Krugman (1995).

<sup>38</sup> See, for instance, Verdoorn (1960), Balassa (1966), and Grubel (1967). By 1977, according to Drabek and Greenaway (1984), intra-industry trade among European Community countries amounted to more than two-thirds of intra-bloc trade in Western Europe.

<sup>39</sup> See, in particular, Kravis and Lipsey (1971).



nontraditional products can contribute to the transformation of so-called infant industries, which are frequently a burden on public resources, into industries that are more likely to be internationally competitive (e.g., Pearson and Ingram 1980).

Although both Viner (1950) and Meade (1955) suggested that significant gains from regional integration arrangements might be associated with scale economies, Corden (1972) was first to set down a formal theory of their potential importance to trade and welfare under customs unions, albeit within an analytical framework that did not formally link scale economies and market structure. Later, Either and Horn (1984) and Smith and Venables (1988) offered more sophisticated models of firm behavior integrating economic relationships among increasing returns to scale, imperfect competition, and segmented markets in which firms set different prices for the same product in markets at home and abroad.<sup>40</sup>

Essentially, inclusion of scale economies in the modern static theory of customs unions identifies possibilities for "fortunate" firms in member countries to produce greater quantities of either differentiated or homogenous products after formation of a customs union or free trade area when trade preferences and resulting shifts in demand in favor of intra-regional trade enable these firms to achieve greater economies of scale and lower output prices as they not only capture but also create larger markets for their output at home and abroad. Increased production by these firms gives rise to economic gains in member countries, termed cost reduction effects by Corden (1972), that are additional to production and consumption gains identified in the Viner and Meade models.<sup>41</sup>

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<sup>40</sup> These models are discussed extensively by Baldwin and Venables (1995). The two models are also discussed further below in this section.

<sup>41</sup> Scale economies can also give rise to trade suppression effects that are additional to trade diversion effects under a customs union or free trade area. Trade suppression effects occur when scale economies give rise to reductions in non-member country exports to member countries. See Corden (1972), Robson (1987), and Pomfret (1988).

Thus, in simple economic models in which scale economies are not related formally to market structure, scale economies offer a possible additional source of economic gains for countries forming regional integration arrangements. However, unlike in the case of high foreign protection or transport costs considered previously, scale economies do not offer a reason why regional integration arrangements might be preferred to unilateral MFN trade liberalization. Indeed, the benefits of greater scale economies might be realized to an equal if not greater extent under MFN trade liberalization.

In addition to achieving cost reduction effects related to increasing returns to scale, regional integration arrangements might successfully erode market power of dominant firms in member countries through encouraging market entry of competing firms from other member countries. This "pro-competitive" effect is widely cited in popular discussions of regionalism. However, the significance of the pro-competitive effect is not assured in recent theoretical studies that point to other effects that might be offset the pro-competitive effect.<sup>42</sup> For instance, a regional integration arrangement might result mainly in shifting production of goods among member countries with little or no reduction in market segmentation, and little or no increase in the number of firms in the trading bloc producing similar products at higher volume and lower profit margin than attributable to the realization of greater economies of scale.

Also, offsetting simultaneous effects might occur even when a regional integration arrangement causes segmented regional markets to become fully integrated. If initially segmented markets are characterized by firms practicing so-called reciprocal dumping of their products in foreign markets (financed by higher profits on sales in their domestic market than abroad), then regional integration arrangements could result in less extensive intra-regional trade than before,

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<sup>42</sup> See Baldwin and Venables (1995) for extensive and highly technical discussion of this issue.

lower prices at home for domestic produced products, and higher prices abroad for imported products. In these circumstances, increased competitive conditions within the trading bloc could increase welfare – substantially according to Smith and Venables (1988) – through cost reduction effects and rationalization of production location, increased sales by domestic firms in domestic markets, and exit by some if not a substantial number of firms. However, Haaland and Wooton (1992), using a general theoretical model, demonstrate that, under imperfect competition and increasing returns to scale with assumed high trade costs and assumed strong preferences of consumers for domestic produced goods, regional integration arrangements might lead to very different results than predicted by "conventional" theoretical and applied models that emphasize pro-competitive effects, including the possibility of prices rising in member countries with dominant firms before market integration.

Recent quantitative studies of the Europe 1992 Plan contributed by Smith and Venables (1988), Gasiorrek, Smith, and Venables (1992), and Harrison, Rutherford, and Tarr (1994) that apply CGE models of imperfect competition with increasing returns to scale suggest that the pro-competitive effects of regional integration arrangements might be very substantial for advanced countries.<sup>43</sup> Nonetheless, in an extensive review of the literature on the economics of regional integration arrangements, Baldwin and Venables (1995) conclude that theoretical and empirical means for testing the overall significance of pro-competitive effects of regional integration arrangements have not been fully developed to date. Also, the welfare effects of regional

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<sup>43</sup> CGE models of imperfect competition with increasing economies of scale are seldom applied to regional integration arrangements among less developed countries. To examine the implications of regional integration arrangements among less developed countries, investigators most often utilize CGE models of perfect competition with constant returns to scale, which tends to limit the magnitude of welfare gains from regional trading blocs. A notable exception to this rule is found in a series of CGE models for less developed countries developed by de Melo and Robinson (1992) in which changes in productivity are assumed linked to export performance. In these alternative models, welfare gains from regional integration for less developed countries are generally found to be dramatically greater than in other models for LDCs. See, for instance, Lewis and Robinson (1996).

integration arrangements on non-member countries and the world economy at large under imperfect competition and increasing returns to scale are not entirely known because the rest of the world is not always treated fully in theoretical and especially quantitative models of imperfect competition and regional integration.

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#### Policy Guideline 8

Under imperfect competition and increasing returns to scale, a regional integration arrangement will be welfare-improving in member countries only so long as pro-competitive effects, including reduction in possible price discrimination between markets by firms, dominate tariff revenue losses and other possible welfare-reducing effects, and result in substantially lower prices for domestic and imported goods as regional firms expand their output in response to increased demand and cost reductions from achieving greater economies of scale. Whether the regional integration arrangement will be beneficial to the world economy as a whole will depend on the relative magnitude of cost reduction effects in member countries versus possible trade suppression effects in non-member countries, the latter arising from trade diversion and reduced economies of scale in production by firms in non-member countries.

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Finally, as noted at the outset of this subsection, product differentiation by firms is commonly encountered in markets characterized by imperfect competition. In theoretical models, imperfect competition can be represented in some appealing ways, typically focusing on the relationship between monopolistic profits and the number of firms in an industry producing similar products.<sup>44</sup> Specification of demands for differentiated products is necessarily complex, and most often specific functional forms for individual or community preferences underlying demand functions are adopted by economic theoreticians and applied economic model builders in order to make their economic models more tractable. Among the most popular functional forms adopted is

the constant elasticity of substitution (CES) function which conveniently reduces the requisite number of demand parameters and allows demand for products to be considered as a two-stage process in which demand for a group of similar products vis-a-vis other groups of similar products can first be determined, and then demands for individual products within a given group of similar products can be determined on the basis of the expenditures on the product group determined in the first stage and relative prices for similar products within the group.

This two-stage or "separable" demand system is convenient but involves some restrictive assumptions that may or may not confound the general findings of economic models involving imperfect competition and differentiated products. This two-stage demand system has also found particular popularity in CGE and other quantitative models of international trade in which goods are assumed differentiable by their country of origin (under conditions of either imperfect or perfect competition), following Armington (1969). In such models, demands for domestic goods and demands for competing imports from different countries are assumed separable with the result that bilateral import demands are typically functions solely of expenditures on imports and relative prices for similar imported products. However, as contended by Winters (1984a, 1984b, 1985), in not accounting for prices of competing domestic products and other variables (such as national income) that determine demands for domestic products, this specification of bilateral import demands can confound the findings of customs union studies which rely on properly assessing changes in domestic and foreign prices, and changes in demands for domestic and foreign goods, to determine the trade and especially welfare effects of regional integration arrangements.<sup>45</sup> Also

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<sup>44</sup> Firms also compete in terms of their variety of products in some models of imperfect competition, giving rise to so-called economies of scope. See, for instance, Smith and Venables (1988).

<sup>45</sup> Winters (1984a) reports that empirical tests of the assumption that demand is separable over foreign and domestic sources, using U.K. data on manufacturing imports and domestic substitutes during 1952-79, find that separability of domestic and imported goods in demand is overwhelmingly rejected.

experiments assuming "central" versus "low" values for elasticities of substitution between similar imports and domestic goods in the Armington demand system conducted recently by Harrison, Rutherford, and Tarr (1997) using a CGE model for Chile suggest that the common practice of specifying low values for demand substitution elasticity parameters in CGE models, on the basis of econometric estimates which are seldom higher than 5-to-10, might bias the simulated impacts of regional integration arrangements on trade and welfare variables significantly, specifically, towards concluding that regional integration arrangements among small countries are beneficial.<sup>46</sup>

Thus, in assessing the trade and welfare effects of customs unions and free trade areas, the functional form of demand systems employed in economic models can matter importantly. With respect to the specification of preference or utility functions for complete demand systems, a notable development is that investigators using CGE models to simulate the impacts of regional integration arrangements, in apparent acceptance of Winters' objection to utilizing the popular Armington demand system in quantitative trade models, have increasingly begun to utilize the so-called almost ideal demand system (AIDS) developed by Deaton and Muellbauer (1980) which involves a flexible elasticity of substitution utility function that allows import demand expenditure elasticities to differ from unity and cross-country elasticities of substitution to vary for different pairs of countries.<sup>47</sup>

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<sup>46</sup> In analyzing Chile's accession to Mercosur, Harrison, Rutherford, and Tarr assume central values of 15 and 30 for demand elasticities of substitution between competing imports and domestic goods (upper-level demand) and between competing imports (lower-level demand) in their model, based on the argument of Reidel (1988) and Athukorala and Reidel (1994) that, when international trade models are properly specified, demand substitution elasticity estimates are not statistically different from infinity and the point estimates of models are in the range of 15-to-30. Under the low substitution elasticity estimates commonly utilized in CGE models, small countries producing differentiated products implicitly have a greater measure of power to affect international terms of trade for their exports. Thus, under regional integration arrangements among small countries, increased intra-regional demands for the goods produced by these countries imparts to these countries greater terms of trade gains than if substitution elasticities in the simulation models were set at higher values.

## Deep Integration

Before turning to the next section examining the findings of quantitative studies of regional integration arrangements, this subsection briefly considers so-called deep integration, which is an essential feature of the Europe 1992 Plan and a growing number of other regional integration arrangements.<sup>48</sup>

Two decades ago, Baldwin (1970) observed that as tariff restrictions were gradually being widely eroded by multilateral trade negotiations, non-tariff barriers were becoming more apparent and significant as hindrances to trade. Today, non-tariff barriers in turn have, arguably, become widely eroded, revealing numerous administrative and regulatory "trade frictions" restricting expansion of multilateral and regional trade from within countries rather than at their borders. These frictions take many forms including customs clearance procedures, product standards and certification systems, labeling requirements, intellectual property enforcement, direct investment policies, and prudential supervision and professional licensing systems. In the context of regional integration arrangements among less developed countries, inadequate or outmoded infrastructure, including networks of roads, railways, and telecommunication systems, might also be included for regional improvement or rationalization under deep integration provisions of modern customs unions and free trade areas.

Under the Europe 1992 Plan, the European Union has sought to redress the deep integration problem by eliminating or harmonizing differences in national administrative procedures and product standards. Ex ante quantitative studies of the impacts of the plan using CGE models of imperfect competition and increasing returns to scale, for instance, contributed by

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<sup>47</sup> See, for instance, Lewis, Robinson, and Wang (1995).

Gasiorek, Smith, and Venables (1992), Haaland and Norman (1992), and Harrison, Rutherford, and Tarr (1994), indicate that, subject to still unresolved questions about appropriate theoretical models and quantitative methods for determining the impacts of regional integration under imperfect competition (noted previously), deep integration in the European Union will increase welfare by 1.0-to-2.0 percent of GDP per annum in the major EU countries (France, Germany, Italy, and the United Kingdom) and by as much as 2.0-to-3.0 percent of GDP per annum in smaller EU countries (e.g., Belgium, Greece, and Ireland).

Today, regional integration arrangements in other parts of the world, including many developing areas, are seeking to incorporate policy reforms similar to those implemented by the European Union and policy reforms extending to other forms of deep integration, with the expectation that deep integration initiatives will greatly facilitate intra-regional trade and investment. Conceptually, eliminating administrative and regulatory trade frictions should be expected to reduce costs of producing and distributing traded goods and, hence, to increase economic welfare through expansion of demand in member countries for regionally-produced goods. However, some uncertainty surrounds whether deep integration undertaken to harmonize national procedures and standards, and to improve regional social infrastructure and communication networks will spur intra-regional trade significantly more than inter-regional trade. Though this uncertainty would seem amenable to analysis using standard theoretical and quantitative tools of static analysis within either the Viner model or Meade model, no prominent studies of the economic impacts of deep integration have been undertaken beyond the ex ante quantitative studies of the aspects of Europe 1992 Plan considered previously, especially in the

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<sup>48</sup> The issue of deep integration is strongly associated with extensive description and discussion of the topic by Lawrence (1996). Deep integration, however, has antecedents in early analyses of regional integration arrangements by other economists, for example, Mikesell (1963).



context of emerging regional infrastructure development goals of less developed countries in such regions as South Asia, Southeast Asia, and Eastern and Southern Africa.

### 5. Quantitative Studies and Findings

From its inception, the static theory of regional integration arrangements has been unsatisfying from a policy making perspective. It has served valuably to caution policy makers about the potential pitfalls of entering into economic cooperation agreements to promote intra-regional trade, investment, and even cross-border movements of labor and human capital. However, it has not proven useful to policy makers interested in more precise predictions about the expected effects of customs unions or free trade areas. The inability of economic theory to derive firm conclusions regarding the static effects of regional integration arrangements, except under special circumstances and sometimes restrictive assumptions (albeit, in accordance with the theory of second-best), has prompted the undertaking of quantitative studies of regional integration arrangements in which the circumstances surrounding individual regional integration arrangements might be taken into explicit account to yield more definitive answers.

Quantitative studies of regional integration arrangements may be classified as mainly empirical or analytical. Empirical studies are typically based on extensive contemporary or historical data, and parameters derived from these data through econometric estimation and hypothesis testing. Analytical studies, on the other hand, typically assume an either sectoral or economywide theoretic structure, and then rely predominantly on *a priori* estimates of key parameters compiled from empirical studies that are not necessarily related to issues raised by customs unions and free trade areas. By their nature, empirical studies involve *ex post* analysis involving not only formally explaining past trends in trade flows and related variables, such as

prices and national income, but also specifying what course – frequently termed the *anti-monde* – trade and other variables would have taken had an extant regional integration arrangement not been established.<sup>49</sup> In *ex post* studies, differences between actual data and the *anti-monde* are ascribed to the effects of the regional integration arrangement, inclusive of unexplained residuals or error terms that are the usual by-products of econometric estimation and model simulation (the so-called residual imputation method). Although they are less frequently encountered, some *ex post* studies employ econometric equations for trade flows (or other variables) to simulate the effects of regional integration arrangements through time by changing only values of explanatory variables directly representing the adoption of regional integration arrangements in the underlying estimation equations, thereby avoiding imputation of changes in unknown variables or random factors to the impacts of the arrangements. In *ex ante* studies, on the other hand, the future course of variables, with and without a regional integration arrangement, must be judged on the basis of at least a minimum theoretic structure.<sup>50</sup>

Notwithstanding that findings of empirical studies might be preferred over findings of analytical studies, today analytical studies employing so-called computable general equilibrium (CGE) models have gained an upper-hand in popularity if not credence for at least two reasons.<sup>51</sup> First, with the recent resurgence of interest in regionalism, many proposals for new or revitalized regional integration arrangements have been presented to policy makers and their advisors with

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<sup>49</sup> It is frequently assumed that, in the absence of a regional integration arrangement, trade patterns between member countries would have followed pre-arrangement trends (a time-series approach) or would have been determined by the same factors determining trade between non-member countries (a cross-section approach). In more sophisticated econometric-based analyses, it is typically assumed that key explanatory variables in an underlying estimation equation or econometric model, such as relative prices in an estimated regression equation for member country intra-bloc imports, would have taken on different values if a regional integration arrangement had not been adopted.

<sup>50</sup> Mayes (1978, p. 16) notes that *ex post* models themselves must be partly analytic because in specifying the *anti-monde*, they must provide "an economic explanation for the post-integration situation."

little possibility for evaluation on the basis of historical data. And second, modern CGE models permit economists increasing latitude to specify and explore the quantitative implications of more general and sophisticated behavioral and technical relationships in static economic models of customs unions and free trade areas than have been possible to solve unambiguously in theoretical models. To be sure, the findings of analytical studies are subject to possibly serious specification errors, as discussed in Section 4 in connection with differentiated products and Armington-type demand systems, that should be acknowledged and assessed for any inappropriate bias, for instance, through sensitivity "tests" covering key parameter values and economic relationships in the underlying analytical models. However, notwithstanding the desirability of undertaking often more painstaking ex post empirical analysis, it remains that the ex ante analytical approach to evaluating regional integration arrangements has gained considerable currency during recent years.

Problems arise in undertaking a review of quantitative studies of customs unions and free trade areas. Although quantitative studies of regional integration arrangements have traditionally sought to measure the benefits of regional trading arrangements and other forms of regional economic cooperation, these studies – particularly ex post studies – have not adhered to the norms of any specific theoretical model or framework. Thus, one finds in quantitative studies a wide variety of economic variables and relationships deemed fundamental to assessing the impact of the customs unions or free trade areas under study. To be sure, quantitative estimates of trade, including trade creation and trade diversion, are prominent in these studies. However, one also

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<sup>51</sup> On CGE modeling and its applications to international trade and development issues, see Dervis, de Melo, and Robinson (1982), Shoven and Whalley (1984, 1992), and Robinson (1989).

often finds other (mainly economywide) variables emphasized, such as real gross domestic product (GDP), wage and exchange rates, and domestic terms of trade.<sup>52</sup>

Without denying other possible choice-variables, including non-economic factors which have been widely cited as key to understanding the formation and benefits of regional integration arrangements,<sup>53</sup> the discussion here takes a mainly normative view of the benefits of customs unions and free trade areas, focusing principally on the findings of quantitative studies regarding the impact of regional integration arrangements on economic welfare. Unfortunately, formal measures derived from the welfare calculus of the theory of tariffs and protection are not always reported by investigators. Thus, more imprecise measures of welfare effects, typically involving changes in trade flows and associated measures of trade creation and trade diversion, are also relied upon in the discussion that follows.

Because a number of extensive and useful reviews of early quantitative studies of regional integration arrangements have been undertaken previously,<sup>54</sup> the discussion here is devoted mainly to examining quantitative studies of regional integration arrangements undertaken since 1990. With the exception of a number of empirical studies based on the so-called gravity model approach, punctuated recently by the publication of a series of gravity model studies by Frankel and his associates (Frankel 1997a, 1997b), recent quantitative studies of new and proposed regional integration arrangements inspired as part of the current resurgence of interest worldwide

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<sup>52</sup> Though undeniably important, the sectoral implications of regional integration arrangements are beyond more than occasional consideration in the discussion here of quantitative studies and their findings. Arguably, sectoral impacts of regional integration arrangements are especially important for the trade and development prospects of less developed countries. For instance, with regard to agriculture in regional integration agreements, see Burfisher, Robinson, and Thierfelder (1992) and DeRosa (1996).

<sup>53</sup> See, Cooper and Massell (1965) and Johnson (1965).

<sup>54</sup> See, for instance, Mayes (1978), Robson (1987), Pomfret (1988), and Baldwin and Venables (1995).

in regionalism have been mainly ex ante analytical studies and, so, form the principal focus of the discussion here.

The "1992 Plan" of the European Union (EU) and the North American Free Trade Agreement (Nafta) have been examined extensively using applied economic models. Also in recent years, a number of current and proposed regional integration arrangements among less developed countries have been examined using applied economic models, especially for regional integration arrangements in Asia and Latin America. The discussion here proceeds first with consideration of quantitative studies on the European Union and Nafta, which are the largest regional integration arrangements in terms of trade coverage and which principally involve advanced industrial countries. The discussion then considers quantitative studies of regional integration arrangements among less developed countries in two major regions: Asia and Latin America.

### **Early Empirical Studies of Regional Integration Arrangements**

Before turning to consider recent ex ante studies, it is instructive to review the principal findings of early, mainly ex post, studies of regional integration arrangements. Early studies share the virtue of analyzing actual data on the experiences of regional integration agreements. Nonetheless, beyond the fundamental problem discussed previously of defining an anti-monde, their empirical methods and results are not without question or even controversy. For instance, econometric models of international trade flows have a long history of yielding estimates of price and substitution elasticities of demand for imports that have been called into question by many economists for their unexpected low magnitude and frequent statistical insignificance.<sup>55</sup>

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<sup>55</sup> See Prais (1962), Leamer and Stern (1970), and Goldstein and Khan (1985).

Among the earliest empirical approaches to assessing the impacts of regional integration arrangements is simply investigating intra-regional trade patterns in the wake of forming a regional trading bloc. Substantial expansion of intra-European Community trade occurred during the 1960s, when the European Community consisted solely of Belgium, France, Germany, Italy, Luxembourg, and the Netherlands. Indeed, intra-EC trade as a share of total EC exports increased from 35 percent in 1960 to 49 percent in 1970. With the expansion of the European Community in the early 1970s to include Denmark, Portugal, and the United Kingdom, intra-EC trade as a share of total trade grew much more slowly, from 49 percent in 1975 to 52 percent in 1981. As noted previously and discussed further below, empirical investigators have also reported the emergence and growth of intra-industry trade in the wake of the EC's formation and expansion.

In contrast, early investigators of regional integration arrangements among less developed countries frequently found the growth of intra-bloc trade lacking. They attribute this finding to not only fundamental factors such as similarity of resource endowments of neighboring countries but also frequent failure of less developed countries to implement fully the terms of their regional integration agreements – and sometimes even deliberate undermining of their regional integration agreements, for instance, by adopting new nontariff barriers on imports from all (member and non-member) countries. In Southeast Asia, the early preferential trading arrangement among the Association of Southeast Asian Nations (Asean) – the so-called Asean PTA – was widely reported after its first decade to have failed to increase intra-bloc trade much above its traditional level of 15-to-20 percent of total Asean trade.<sup>56</sup> And, in Latin America where regional integration arrangements among less developed countries have their longest history and were clearly adopted to promote import substitution on a region-wide basis, expansion of intra-regional trade in

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<sup>56</sup> See, for instance, Naya and Plummer (1991).

manufactures and all goods failed to match the expansion of intra-regional trade in the European Community or the outward-oriented East Asian newly industrialized countries (Korea, Hong Kong, Singapore, and Taiwan). For instance, as reported by Nogues and Quintanilla (1993), while intra-regional trade in manufactures during 1965-90 by the outward-oriented Asian NICs grew from 2.0 percent of GDP to 6.9 percent of GDP, intra-regional trade in manufactures during the same period by the Andean Pact countries<sup>57</sup> grew from 0.1 percent of GDP to only 0.6 percent of GDP.

More sophisticated early empirical studies of regional integration arrangements focused on the impacts on European Community trade, particularly EC trade in manufactures, after the Rome Treaty of 1957, using a variety of ex post approaches.<sup>58</sup> The most ambitious and successful of these early empirical studies – studies by Truman (1969) and Prewo (1974) using trade share measures, Balassa (1967, 1975) using income elasticities of demand for imports and the novel assumption that higher (lower) income elasticity values imply trade creation (diversion), and Aitken (1973) using the gravity model approach explaining bilateral trade flows econometrically by, among other variables, transportation costs, income levels between trading partners, and institutional factors such as the formation of regional trading blocs – sought to estimate trade diversion as well as trade creation. Despite their different approaches, these early empirical studies found that, following creation of the European Community, trade creation in manufactures significantly outweighed trade diversion in manufactures. Moreover, they also generally found that formation of the European Community led to significant expansion of manufacturing exports

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<sup>57</sup> Bolivia, Chile, Colombia, Ecuador, Peru, and Venezuela. Chile left the Andean Pact in 1976.

<sup>58</sup> Ex ante studies of the European Community were also undertaken at an early date, the most prominent by Scitovsky (1958), Verdoorn (1960), and Balassa (1962). For extensive discussion of early ex post studies of the European Community, see Balassa (1975) and Mayes (1978). The discussion here draws on more recent discussions by Robson (1987) and Pomfret (1988).

to EC countries by non-member countries. The significant expansion of manufacturing exports to EC countries is most often interpreted as reflecting liberalization and rationalization of EC external tariffs under the Rome Treaty. In sum, early empirical studies found that the European Community was trade-creating on a net basis for not only the new trading bloc but also the world economy.

Balassa (1975) went beyond estimating the impacts of the European Community on trade, namely, to consider the impact of the new regional integration arrangement on EC welfare. Using the average EC tariff rate for manufactures and his own estimate of trade creation for 1970, he calculated that EC welfare was improved by \$0.7 billion per annum, or 0.15 percent of EC GDP per annum. Additionally, he considered the economic cost of trade diversion under the EC Common Agricultural Policy, which he calculated at \$0.3-to-0.4 billion per annum. Thus, he arrived at a net welfare gain for the EC customs union of \$0.4 billion per annum, or less than one-tenth of one percent of EC GDP per annum.<sup>59</sup>

Finally, some early empirical studies sought to quantify the impacts of the new European Community on other variables, including the distribution of gains in trade among member countries. Two empirical studies stand out because of later quantitative studies on the European Union and other regional integration arrangements among advanced countries spawned by the two early EC studies. The first study is by Balassa (1966). Balassa reported that expansion of trade under the EC customs union was composed importantly of intra-industry trade rather than inter-industry trade, suggesting that increasing returns to scale in production by individual firms was a significant factor underlying competition among firms in Western Europe and advanced

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<sup>59</sup> No early empirical investigators sought to quantify the economic costs or benefits of the European Community for non-member countries (with the possible exception of the EFTA countries). In particular, the apparent benefit



countries in other regions and, as such, could be the source of substantial (additional) gains from regional integration under the European Community. The second study is by Owen (1983). Owen provided empirical estimates of the significance of scale economies for some major EC industries (mainly appliances, autos, and other roadway vehicles). Based on his finding of substantial scale economies in the industries considered, Owen concluded that, if his estimates are applicable to all EC manufacturing, the cost reduction effects from achieving greater economies of scale under regional integration in Western Europe might have amounted to 3-to-6 percent of EC GDP in 1980.

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to non-member countries of the expansion of their exports to EC countries was not examined against the possibility of simultaneous adverse terms of trade changes.

## **Regional Integration Arrangements among Advanced Countries**

Broadly speaking, the most sophisticated CGE models have been applied to analyzing regional integration arrangements among the countries forming the present day European Union and new North American Free Trade Agreement. In particular, reflecting the advent of imperfect competition theory applied to inter-industry trade among advanced countries such as the United States, Germany, and Japan, these models frequently assume the existence of imperfect markets in which prices are set above both marginal and average costs, typically in the presence of increasing returns to scale (as presaged by the empirical findings of Balassa (1966) and Owen (1983)). Among other features, not necessarily exclusive to regional integration arrangements among advanced countries, these models also widely feature demands for goods used as intermediate factors of production and considerable disaggregation of not only intermediate and final consumption goods but also primary factors of production. Finally, it should be emphasized that, in contrast to the assumption of homogeneous goods in the Vinerian and Meade models, virtually all modern CGE models assume that consumers differentiate similar products by country of origin and sometimes (in imperfect competition models) by producing firms. Under conditions of either perfect competition or imperfect competition between firms, the assumption of products differentiated by country (or firm) ascribes to each trading country, both large and small, a measure of market power in the global economy (ultimately determined by the effective magnitude of demand substitution elasticities facing country-specific products worldwide) to affect the terms of trade for a country's exports by means of not only direct taxes or controls on exports but also protection measures such as import tariffs and quantitative restrictions.<sup>60</sup>

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<sup>60</sup> Protection measures, including nontariff barriers to imports, affect the terms of trade of a country's differentiated exports by the so-called Lerner symmetry theorem which demonstrates that protection measures restricting imports are equivalent to a tax on exports. See Lerner (1936).

### **European Union**

The European Union and its antecedents in the European Coal and Steel Community and European Community hold considerable pride of place in discussions of regional integration arrangements, and, as discussed previously, the European Community has been the subject of many quantitative studies, both *ex post* and *ex ante*.<sup>61</sup> Notwithstanding long-standing issues concerning expansion of membership of the European Union,<sup>62</sup> the primary issue surrounding the European Union most recently has been the trade and welfare implications of the so-called 1992 Plan under which deepening of economic integration in the European Union is to be accomplished by adoption of common product standards and elimination of other "trade costs" represented by not only import restrictions but also national industrial and commercial regulations hindering complete integration of markets for goods and services in the European Union.

The results found by three prominent quantitative studies of this issue are presented in Table 3. These studies consider the implications of reducing intra-union trade costs for manufactures by 2.5 percent, in principle enabling EU firms producing differentiated products under imperfect competition to expand output and reduce costs along declining average cost schedules. The studies by Gaiorek, Smith, and Venables (1992) and Haaland and Norman (1992) are both based on an analytical model of imperfect competition in the European Community developed by Smith and Venables (1988). Furthermore, both studies consider the implications of complete market integration in the European Union, in which EU firms do not set different prices for the same product in different member countries. The third study by Harrison, Rutherford, and Tarr (1994) employs a somewhat more extensive and sophisticated model that does not impose

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<sup>61</sup> Analyses by Sapir (1992) and Winters (1993) are among the more recent general discussions of issues and quantitative analyses of economic integration under the European Communities and European Union.

uniform pricing by firms across EU markets. Instead, the investigators in the third study represent standardization of products under the 1992 Plan by substantially increasing values of substitution elasticities of demand in EU countries to reflect significantly increased possibilities for substitution in demand in member country markets for similar products produced by competing EU firms.

The quantitative results indicate that deepening of economic integration in the European Union should be expected to achieve substantial economic gains, on the order of 1 percent of GDP per annum in several EU countries, owing predominantly to pro-competitive effects of product standardization (with increasing returns to scale).

The results also suggest the occurrence of appreciable trade diversion under the 1992 Plan, possibly limiting gains in welfare in the European Union and possibly contributing to losses in welfare in other parts of the world. Indeed, given the large size of the European Union, the pro-competitive effects of the 1992 plan might be expected to have spillover effects on firms in non-member countries and even firms within the European Union. Details of the CGE simulation results do indicate that considerable rationalization of production occurs within the European Union, with large numbers of EU firms forced to shut down in the face of declining terms of trade (and profit margins). However, the "evidence" from the model simulations indicates that, although similar pro-competitive pressures must rebound on non-member country firms, spillover effects on economic welfare are negative and arguably appreciable for the European Free Trade Area (EFTA) countries (-0.10 percent of GDP per annum), and negative and insignificant for Japan and the United States (-0.01 percent of GDP per annum).<sup>63</sup>

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<sup>62</sup> Greece acceded to the European Community in 1980, followed by Spain and Portugal in 1986. On possible future expansion of the European Union to include Eastern European countries, see for instance Baldwin (1994).

<sup>63</sup> See quantitative results for Haaland and Norman (1992) in Table 3. After a span of 10 years, the impact on the EFTA countries would be an accumulated 1 percent of GDP, while the impact on Japan and the United States would be an accumulated 0.1 percent of GDP.

### **North American Free Trade Agreement**

The North American Free Trade Agreement, adopted in 1992, is an outgrowth of the 1988 Canada-United States Free Trade Agreement (and earlier Canada-U.S. trade cooperation pacts),<sup>64</sup> extended to include Mexico as part of Mexico's program of extensive economic reforms begun during the late-1980s. Nafta is remarkable for not only its shared preeminence with the European Union as a regional integration arrangement but also its inclusion of both advanced countries (Canada and the United States) and less developed countries (Mexico currently, but also possibly Chile and Mercosur countries in the future).

Representative of recent ex ante quantitative studies of Nafta are the three studies presented in Table 4. Like the previous studies of the 1992 Plan for the European Union, the two studies by Brown, Deardorff, and Stern (1992) and Roland-Horst, Reinert, and Shiells (1992) involve CGE models incorporating imperfect competition and increasing returns to scale. The Brown, Deardorff, and Stern model assumes firms set prices above average cost (though monopolistic profits are eventually bid away by entry of new firms), while the Roland-Horst, Reinert, and Shiells model assumes firms set prices at average cost following the so-called contestable market theory (with no entry or exit by firms). The third study by Bachrach and Mizrahi (1992) involves a more simply specified model, namely, one assuming perfect competition and constant returns to scale in production.<sup>65</sup>

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<sup>64</sup> Quantitative analysis of trade cooperation pacts between Canada and the United States dates to the seminal contribution of Wonnacott and Wonnacott (1967), which notably was among the earliest quantitative studies to investigate and show the importance of increasing returns to scale to trade and welfare effects of regional integration arrangements.

<sup>65</sup> Judging by the discussion of recent CGE models of regional integration arrangements among less developed countries discussed further below in this section, the specifications of the Bachrach-Mizrahi model might be considered appropriate for Mexico but less so for Canada and the United States. Nonetheless, the results found by

All three studies find that Nafta provides positive gains to member countries. However, the variation in simulated economic gains is wide, with the smallest gains found by the Bachrach and Mizrahi model (gains range from insignificant for Canada and the United States to 0.32 percent of GDP per annum for Mexico) and the largest gains found by the Roland-Horst, Reinert, and Shiells model (gains range from 2-to-3 percent of GDP per annum for the United States and Mexico, respectively, to 10.57 percent of GDP per annum for Canada).

As might be expected, the largest proportionate gains tend to be found for Mexico, which is essentially a small country that gains access to two large markets for its exports of agricultural products and labor-intensive manufactures (formerly covered by extensive administered controls in Canada and the United States). Thus, liberalizing Mexico's trade regime vis-a-vis Canada and the United States arguably approximates liberalizing Mexico's trade regime vis-a-vis the world at large. Indeed, according to the simulation results, Nafta would appear to stimulate rather than repress imports from non-member countries, presumably because of strong positive income and welfare effects.<sup>66</sup>

The simulation results for the United States, which is essentially a large country forming a trading bloc with two much smaller trading partners, indicate that appreciable if not significant trade diversion occurs in connection with U.S. imports from non-member countries. However, this trade diversion is apparently not sufficiently large to negatively impact the overall U.S. economy. Moreover, at least in the case of the simulation results found by Roland-Horst, Reinert, and Shiells, assumed "protective" pricing by monopolistic U.S. firms in contestable markets, in

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the Bachrach-Mizrahi model provide an (imprecise) yardstick for the importance of the more sophisticated technical and behavioral relationships specified in the two alternative models of Nafta considered here.

<sup>66</sup> As the notes in Table 4 indicate, still larger trade and welfare effects are found for Mexico (and United States) if other terms of Mexico's accession to Nafta are represented in the CGE model simulations. These terms include especially liberalization of Mexico's policies governing inward foreign direct investment.

conjunction with scale economy effects, magnify the pro-competitive effects of Nafta on both trade and welfare found by Brown, Deardorff, and Stern, who assume the traditional (Cournot-type) specification of monopolistic pricing following the approach of the three quantitative studies of the EU 1992 Plan highlighted in Table 3.

Finally, only the simulation results of the Brown, Deardorff, and Stern model provide explicit indication of possible spillover effects of Nafta on third-countries. Specifically, the Brown, Deardorff, and Stern model results indicate that, although substantial diversion of trade with non-member countries might occur, the impact on welfare in the rest of the world is unlikely to be appreciable. Given, however, the limited (reported) disaggregation of trade and welfare effects on third-countries in the simulation results of the Brown, Deardorff, and Stern model and considerations for basic trade theory, the possibility of significant negative impacts on particular individual non-member countries should not be discounted. Strong possibilities in this regard are Caribbean and Central American countries, and even some East Asian countries, whose exports of agricultural products and especially labor-intensive manufactures might be supplanted under Nafta.

Whether such third-countries will be adversely affected by Nafta will depend on the nature of their recourse to alternative world markets, as discussed recently by Leamer et al. (1995) for the case of Central American countries whose exports of apparel and other labor-intensive goods to the United States are expected to be supplanted by expansion of competing exports from Mexico under Nafta. Using an applied partial equilibrium model, notably, assuming homogeneous rather than differentiated products, Leamer and his associates point to the possibility that the Central American countries might make up for lost exports to the United States by increasing their exports to Mexico. Specifically, they contend that, depending upon the openness, size, and

capacity of the Mexican economy to redirect domestic output and expand exports to the United States (creating increased demands for imports of both intermediate goods and consumer goods), Mexico's neighboring Central American countries might not lose under Nafta. Indeed, bolstered by the simulation results of their model, Leamer and his associates conclude that, so long as Mexico maintains a relatively open economy admitting unfettered imports and ensuring growth of the Mexican economy to a "large" size, and so long as both production and distribution of goods in the Central American countries are sufficiently flexible to redirect exports from U.S. markets to Mexican markets, the Central American countries might count on enjoying appreciable economic gains as a result of Nafta.<sup>67</sup>

### **Regional Integration Arrangements among LDCs**

Although advanced countries have arguably taken primary leadership in adopting regional integration arrangements during the current resurgence of regionalism, less developed countries have also actively formulated and begun to implement plans for new or revitalized regional integration arrangements, despite their past failure and disappointment at early regional and even global agreements for economic cooperation among LDCs.<sup>68</sup> Countries in Asia and Latin America have made the greatest progress in designing and implementing pacts for regional trade cooperation. However, important proposals for adopting customs unions, free trade areas, and other regional trading arrangements are under discussion or study in other major developing

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<sup>67</sup> An important corollary of the Leamer et al. findings is that the U.S. effective tariff is reduced to zero in a number of product categories as Mexican exports to the United States, combined with increased Mexican imports from Central America and other third-countries, effectively reducing U.S. domestic prices in the product categories affected to world levels.

<sup>68</sup> For a general discussion of past experiences of LDCs with regional cooperation agreements, see Langhammer and Hiemenz (1990). Also see the series of regional perspectives on regional integration arrangements in de Melo and Panagariya (1993).



regions, including the Middle East and North Africa, which has also begun to initiate bilateral "hub-and-spoke" trading accords with the European Union under the EU's Mediterranean Free Trade Initiative, and Sub-Saharan Africa.<sup>69</sup>

Recent quantitative studies of regional integration arrangements among less developed countries undertaken using CGE models differ in important respects from the previously reviewed quantitative studies of regional integration arrangements among advanced countries. Most important, quantitative studies of regional integration arrangements among LDCs generally assume perfect competition among firms and constant returns to scale in production. This "paradigm shift" mirrors the stylized view of firms in less developed countries as being predominantly producers of mainly traditional commodities and labor-intensive manufactures that are produced using widely available ("off-the-shelf") technologies and sold chiefly in competitive domestic and foreign markets.<sup>70</sup> Notwithstanding this paradigm shift, CGE models employed to investigate regional integration arrangements among LDCs commonly adopt the assumption that consumers in trading countries differentiate similar products according to their place of production. However, perhaps reflecting recent evolution of economic modeling techniques, the CGE models for less developed countries reviewed here involve specification of the almost ideal demand system (AIDS) formulated by Deaton and Muellbauer (1980), which, unlike the constant elasticity of substitution utility functions in the Armington (1969) demand system (used widely in the CGE models of regional integration among advanced countries reviewed previously), allows

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<sup>69</sup> On the EU's Mediterranean Free Trade Initiative and its implications for countries in the Middle East and North Africa, see Hoekman and Djankov (1996) and Galal and Hoekman (1997). For a recent discussion of prospects for regional integration in Sub-Saharan Africa, see Oyejide, Elbadawi, and Collier (1997).

<sup>70</sup> In the modern global economy, these characterizations of less developed countries might be challenged on several counts. Also, in multi-country CGE models in which both advanced countries and less developed countries are included, firms and consumers in both types of countries are typically modeled in the same way, that is, adopting the stylized assumptions of perfect competition and constant returns to scale for all countries.

expenditure elasticities for imports and domestic substitutes to differ from unity and demand substitution elasticities to vary for different pairs of countries. Finally, although economies of scale do not feature prominently in recent quantitative studies of customs unions and free trade areas among less developed countries, some investigators have incorporated relationships linking sectoral and economywide productivity changes to export performance in their models with the result that, not unlike incorporating increasing returns to scale in CGE models, one finds substantially greater gains in trade and economic welfare from trade liberalization on not only a preferential basis but also a nondiscriminatory basis.<sup>71</sup>

## **Asia**

**Asean Free Trade Area**. The Association of Southeast Asian Nations (Asean) is the longest-established regional group for economic (and political) cooperation within Asia. The association also holds legitimate claim to being the first if not most prominent group of less developed countries worldwide to formulate and implement a regional free trade area under the current resurgence of regionalism, the Asean Free Trade Area (Afta), which was adopted in 1992 and will be implemented fully by 2003.

Several studies have examined Afta, but few studies have given it extensive or very serious quantitative representation. Two recent exceptions are studies by DeRosa (1995) and Lewis and Robinson (1996), whose findings are summarized in Table 5. Both studies find that Afta is trade-creating on a net basis. The larger gains in trade and marginally larger gains in welfare found by DeRosa are attributable in part to the differences in base periods and simulation scenarios between

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<sup>71</sup> See de Melo and Robinson (1992) for a general discussion of productivity changes in models of export-led growth.

the two studies. Whereas DeRosa employs pre-Uruguay Round levels of tariff and nontariff protection and does not take into account liberalization by the Asean countries under the Uruguay Round, Lewis and Robinson take into account the outcome of the last multilateral trade negotiations before simulating the incremental quantitative impacts of Afta. Nonetheless, both studies find that Afta contributes comparatively little to higher economic welfare in Asean countries, except possibly the two highest-income and particularly open Asean countries, Malaysia and Singapore. This seems counterintuitive in light of the static economic theory reviewed in section 3 which found that relatively open economies should be expected to experience limited if not negative gains from regional integration arrangements. However, as DeRosa explains, both Malaysia and Singapore benefit principally from the diversion of trade by other Asean countries. The two countries supply the largest proportion of the increased intra-regional demand for manufactures previously supplied by advanced countries outside the region. And, owing to its especially open economy (and real exchange rate appreciation under Afta<sup>72</sup>), Singapore expands its consumption possibilities and gains from trade with not only member countries but also countries outside Southeast Asia (i.e., no effective diversion of Singapore's trade occurs).

The Lewis-Robinson model incorporates the AIDs demand system and fully endogenous models for other Asian countries (including Japan), the European Union, and United States. The precise implications of assuming a more flexible demand system are not apparent from the

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<sup>72</sup> Though endogenous exchange rates are a feature of most applied international trade models today, few quantitative studies of regional integration arrangements highlight the role of exchange rate adjustment in simulation results. When countries joining customs unions or free trade areas benefit substantially from expansion of their imports arising from trade creation, exchange rate depreciation often plays an appreciable enabling role. Alternatively, when member countries, such as Singapore in Afta, benefit substantially from expansion of their exports arising from trade diversion in other member countries, exchange rate appreciation often plays an enabling role in the adjustment to a new external (and domestic) equilibrium.

simulation results in Table 5. However, it is apparent that the model finds little by way of significant international spillover effects emanating from formation of Afta.

Finally, both DeRosa and Lewis and Robinson report that alternative scenarios in which the trade regimes of the Asean countries are liberalized on a concerted MFN basis rather than preferential basis yield substantially larger gains in trade and economic welfare. This finding is consistent with the pure static theory of customs unions and free trade areas. In the context of the "missing foreign tariffs" theory of customs unions advanced by Wonnacott and Wonnacott (1981), this finding also suggests that foreign levels of protection facing Asean exports are not so high as to provide the new Asean Free Trade Area with opportunities for economic gains through preferential trade liberalization that are greater than those available to Asean countries through concerted if not unilateral MFN trade liberalization.<sup>73</sup>

**Asia-Pacific Free Trade Area.** During the last two decades, trade and growth in the Asia-Pacific region have come to rival trade and growth in the North Atlantic region formed by Canada, the European Union, and United States. In recent years, less developed countries in the Asia-Pacific region have also joined with advanced countries in the region, including Japan and the United States, to form the Asia-Pacific Economic Cooperation (Apec) Forum. This group consists mostly of relatively open economies. However, notwithstanding the current financial crisis in Asia, Apec is considering proposals to establish an Asia-Pacific free trade area.<sup>74</sup> Pure

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<sup>73</sup> Essentially this conclusion follows from the fact that, despite significant advances in trade liberalization in many if not most developing countries during the last decade or more, protection levels remain higher on average in less developed countries than in advanced countries. It is also important to recognize that simulations of many CGE models, even though they may not be truly global models, are explicitly contingent upon protection levels in foreign countries as well as the countries that are the primary focus of the models. Thus, in both the DeRosa study and the Lewis-Robinson study, protection levels in not only the Asean countries but also foreign countries are taken into account.

<sup>74</sup> See Apec (1993, 1994) and Bergsten (1997).

trade theory and the policy guidelines derived previously from the Vinerian and Meade models present conflicting views of the prospects of an Asia-Pacific free trade area. On the one hand, the size and diversity of the Apec countries suggest that an Asia-Pacific free trade area would be strongly trade-creating. On the other hand, the relative openness of the Apec countries suggests that net economic gains under an Asia-Pacific free trade area might be elusive because tariff revenue losses from diversion of trade with major trading partners in Western Europe and other regions, such as Latin America, South Asia, and the Middle East, could be more substantial than the magnitude of possible production-related or consumption-related gains in economic welfare, including for low-to-middle-income Apec countries such as the Asean-4 countries.

Lewis, Robinson, and Wang (1995) investigate the quantitative implications of an Asia-Pacific free trade area using a model similar to that employed by Lewis and Robinson (1995) to analyze Afta. The hypothetical free trade area is found to be trade-creating, in the aggregate and for individual Apec countries. Only in the case of the United States does trade diversion appear to be substantial, amounting to nearly 70 percent of the total increase in U.S. imports. It is also notable that trade diversion attributable to the free trade area falls to the greatest extent, over \$26 billion per annum at 1989 prices, on developing countries outside the Asia-Pacific region rather than the European Union.

Despite the size and diversity of the Asia-Pacific region, few countries are found to enjoy substantial gains in economic welfare, including the United States and China. Only welfare in the East Asian NIEs (Hong Kong, Korea, and Taiwan) and Japan is significantly improved, by about 2.5 percent and 1.0 percent respectively. The significant gains by Japan and East Asian NIEs may

reflect improved access to markets in the United States where protection is widely reported to be targeted on imports from particularly Japan and other high-income East Asian countries.<sup>75</sup>

Further, the quantitative results provided by Lewis and his associates would seem to deny the hypothesis discussed in Section 3 that small countries, such as the Asean-4 (Indonesia, Malaysia, Philippines, and Thailand), might expect to gain considerably from joining a large trading bloc such as the hypothetical Asia-Pacific free trade area. Indeed, the quantitative results indicate that the four Asean countries would enjoy welfare gains of less than 0.5 percent,<sup>76</sup> unless the improvement in their export performance is assumed to induce productivity gains in which case the four Asean countries might enjoy welfare gains of more than 4.0 percent according to Lewis et al.<sup>77</sup>

### **Latin America and Greater Western Hemisphere**

Nafta has aroused the interest of policy makers throughout the Western Hemisphere and especially Latin America. Fearing that access of exports to markets in Nafta countries, especially the United States, will be significantly diminished, policy makers in Latin America are particularly interested in the possibility of other Western Hemisphere countries joining Nafta, a possibility raised in the Nafta agreement itself and discussed most often in terms of accession to Nafta by

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<sup>75</sup> The extent to which protection statistics employed by Lewis, Robinson, and Wang reflect U.S. targeting of protection measures against imports from high-income East Asian countries is uncertain.

<sup>76</sup> It is tempting to compare the welfare effect of the Asia-Pacific free trade area for the Asean-4 found by Lewis, Robinson, and Wang (1995) to the welfare effect of Afta for the Asean countries found by DeRosa (1995) and Lewis and Robinson (1996). Unfortunately, such comparisons are hindered by, in addition to differences in the specifications of the underlying CGE models, differences in the measurement of welfare changes and differences in the simulation base year. Were it possible to identify the Asean-4 countries individually in the Lewis-Robinson-Wang model, an appropriate "test" of the hypothesis that small countries gain more from accession to a large trading bloc than a small trading bloc would be a comparison of the magnitude of the welfare gains found by the Lewis-Robinson-Wang model for the Asean-4 countries under Afta versus under the Asia-Pacific free trade area.

Chile. Policy makers in Latin America are also interested in the implications of sub-regional integration arrangements in the Western Hemisphere, including possible interlocking hub-and-spoke trading arrangements.<sup>78</sup> Finally, agreement in principle reached by Western Hemisphere countries in 1994 to establish the Free Trade Area of the Americas (Ftaa) by the year 2005 raises questions about the possible global effects of regional integration arrangements in the Western Hemisphere.

**Greater Nafta.** Among other possibilities, Nafta might be expanded to include the countries of the Caribbean and Central America, in effect, forming a greater North American free trade area (Gnafta). Gnafta is investigated in an ex ante study by Hinojosa-Ojeda, Lewis, and Robinson (1995) using an early model of Nafta crafted to focus on agricultural and labor migration issues.<sup>79</sup> The results of the study, presented in panel 1 of Table 6, indicate that the countries forming Gnafta would enjoy appreciable gains in trade but not welfare. In terms of welfare, the United States and Central America do not achieve appreciable gains at all, while the Caribbean countries and Mexico achieve gains in welfare amounting to less than 0.25 percent of GDP per annum. The reasons for this outcome are not clear, except in the case of the United States whose economy is too large to be significantly affected by Gnafta's formation and possibly in the case of Mexico whose increase in imports under the hypothetical regional integration arrangement is accompanied by substantial trade diversion. For the Caribbean and Central American countries, trade diversion is much less appreciable (relative to total increased imports),

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<sup>77</sup> Under the assumption of trade-productivity linkages, gains in economic welfare for other countries in the Lewis, Robinson, Wang study are less dramatic. The increase in real absorption rises to 3.1 percent in the East Asian NIEs, 2.0 percent in China, and 1.3 percent in Japan. For the United States, it rises to only 0.2 percent.

<sup>78</sup> See, for instance, Wonnacott (1996) and Wonnacott and Wonnacott (1996).

<sup>79</sup> See Hinojosa-Ojeda and Robinson (1992) and Robinson et al. (1993).

and exports expand significantly. Nonetheless, only in simulations of the Hinojosa-Ojeda et al. model in which productivity gains are linked to improved export performance, termed “dynamic” simulations by the study investigators, do the Caribbean and Central American countries (and Mexico) achieve significant gains in welfare under Gnafta, specifically, welfare gains in the range of 3-to-5 percent of GDP per annum.<sup>80</sup>

**Mercosur**. Countries of the Southern Cone of Latin America have embraced regionalism more actively than countries in Central America and the Caribbean. This applies particularly to member countries of the South American Common Market (Mercosur) – Argentina, Brazil, Paraguay, and Uruguay – which was established as a customs union in 1991 and, in recent years, has achieved significant reduction if not complete elimination of tariffs and nontariff barriers to intra-Mercosur trade.

One quantitative study of Mecrosur that has engendered a great deal of interest, and debate, is a (rare) ex post study of the new regional integration arrangement undertaken by Yeats (1997). Rather than assessing trade creation and diversion, and their net welfare impacts, Yeats investigates whether recent commodity patterns of exports by Mercosur countries to different destinations conform to the past revealed comparative advantage of Mercosur countries in natural resource-intensive and labor-intensive goods. He finds that the fastest growing products in intra-Mercosur trade are capital-intensive goods in which Mercosur countries have not previously displayed strong export performance. Thus, the Yeats study suggests that the new patterns of

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<sup>80</sup> Additional scenarios investigating the implications of hub-and-spoke trading arrangements with Mexico and the United States serving alternatively as the hub-country find that gains to the two hub-countries are higher than under Nafta but not Gnafta. Also, under the hypothetical hub-and-spoke arrangements, the Caribbean and Central American countries benefit most from trading arrangements featuring the United States as the hub-country because of greater benefits from duty-free access to the U.S. market than from duty-free access to the Mexican market.



trade by Mercosur countries, which are at odds with what their historical comparative advantage would predict (the *anti-monde* in the Yeats study), are indicative of possible adverse effects of Mercosur on member countries and the world at large.

Another recent study of Mercosur that does not rely on CGE modeling is an ex ante study of the significance of geographic proximity among member countries for intra-regional trade and economic welfare by Amjadi and Winters (1997). This study explores whether the Wonnacott hypothesis (Wonnacott and Wonnacott 1981, 1992) that regional integration arrangements offer member countries opportunities for enjoying economic gains from avoiding trade-costs with third-countries is applicable to Mercosur. Specifically, Amjadi and Winters investigate whether transportation costs between Mercosur countries and the rest of the world (represented by the United States) are sufficiently high to afford significant gains to Mercosur countries from adopting preferential trade with one another. Amjadi and Winters find that extra-regional transportation costs are appreciably higher than intra-regional transportation costs but that the margin between the two costs is not large enough *per se* to yield substantial gains with the introduction of trade preferences among Mercosur countries.

Two recent ex ante studies of Mercosur using CGE models, by Flores (1997) and by Hinojosa-Ojeda, Lewis, and Robinson (1997), provide, arguably, a more encompassing view of the expected effects on trade and welfare of the new regional integration arrangement in the Southern Cone.<sup>81</sup>

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<sup>81</sup> It has been suggested the results found by Yeats (1997) are partial equilibrium in nature, whereas results found by CGE models of Mercosur are superior if not more reliable because of their general equilibrium character. As ex post results, however, the Yeats results are the outcome of a general equilibrium process (whatever the precise elements of that process might be), whereas CGE model results, while they may be more encompassing in the sense of yielding formal results for overall changes in trade and economic welfare, are ex ante in character and therefore without empirical verification.

The Flores model is patterned after the model of imperfect competition with increasing returns to scale employed by Gasiorrek, Smith, and Venables (1992) to investigate the 1992 Plan for the European Union. The Hinojosa-Ojeda, Lewis, and Robinson model, on the other hand, is an updated and enlarged version of the model of perfect competition under constant returns to scale employed by the three collaborators to investigate the effects of the hypothetical Gnafta. The simulated trade and welfare effects found using the two models are presented in panels 2 and 3, respectively, of Table 6.

The simulation results reveal sharp differences in economic effects between the two models. Both models "predict" Mercosur will be trade-creating – notably, without even modest trade diversion.<sup>82</sup> However, the Flores model finds much smaller trade effects for Mercosur countries than the Hinojosa-Ojeda et al. model. Moreover, the Flores model finds welfare effects for Mercosur countries that are generally positive and significant (between 1 percent and 2 percent of GDP per annum), whereas the Hinojosa-Ojeda et al. model finds welfare effects for the Mercosur countries that are generally positive but insignificant (less than 0.25 percent of GDP per annum). The explanation for the smaller trade effects in the Flores model are not entirely clear, but they might be related to the model's specification of imperfect rather than perfect competition. The explanation for the difference in welfare effects between the two models is more certain. Specifically, as Flores reports based on experiments with his model, increasing returns to scale contribute more extensively than other model features to his estimates of welfare gains for Mercosur countries.<sup>83</sup>

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<sup>82</sup> The absence of trade diversion in the simulation results found by the two studies is not explained by the study investigators.

<sup>83</sup> When Hinojosa-Ojeda, Lewis, and Robinson incorporate the assumption that productivity growth is linked to export performance in their model, the three investigators also report substantially larger gains in economic

Finally, the results found by Hinojosa-Ojeda, Lewis, and Robinson indicate no sizable spillover effects of Mercosur on the Nafta countries or Chile, which is an "associate" member of Mercosur (as discussed in the next sub-section) and the most outward-oriented country in the Southern Cone. With regard to the rest of the world, what results are presented by Hinojosa-Ojeda, Lewis, and Robinson indicate that other countries might enjoy substantially expanded trade with Mercosur countries, amounting to more than \$600 million.<sup>84</sup>

**Chile's Trade Policy Options.** Having gradually adopted a uniform tariff of about 11 percent during recent years, Chile is the most outward-oriented country in the Southern Cone region today. Chile might continue to liberalize its trade regime on a unilateral basis. But regionalism in the Western Hemisphere presents Chile with opportunities to gain access to either Mercosur or Nafta, on a free trade basis (Nafta) or a customs union basis (Mercosur). In 1996, Chile agreed in principle to become an associate member of Mercosur and, in effect, to form a free trade area with the Mercosur countries, without precluding its options also to become a future member of Nafta.

Hinojosa-Ojeda, Lewis, and Robinson (1997) and Harrison, Rutherford, and Tarr (1997) both use multi-country CGE models of perfect competition with constant returns to scale to explore these and other trade policy options facing Chile. Derived from their larger study of Mercosur, the results found by Hinojosa-Ojeda, Lewis, and Robinson are mostly familiar, and they indicate that Chile would benefit from joining either Mercosur or Nafta, but not appreciably (see Table 6, panel 4). The results found by Harrison, Rutherford, and Tarr (hereafter HRT) differ

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welfare for Mercosur countries, specifically, about 3 percent and 5 percent of GDP per annum for Argentina and Brazil respectively.

<sup>84</sup> An explanation for this result is not provided by Hinojosa-Ojeda, Lewis, and Robinson.

importantly from those found by Hinojosa-Ojeda, Lewis, and Robinson, and they are reviewed more extensively here (see Table 6, panel 5).

The HRT model is not particularly distinct from the other multi-country CGE models for less developed countries reviewed here, except in one important regard. Whereas in most multi-country models with commodities and goods differentiated by place of production values not exceeding 5-to-10 are assumed for import demand elasticities of substitution, in the HRT model "central" values for import demand elasticities of substitution are set equal to 30. The rationale for assuming such large central values for import substitution elasticities is that in the long-run (10 years or more) consumers will take most if not every opportunity to substitute lower-priced imports for higher-priced imports that are otherwise very similar.<sup>85</sup> This imparts considerable price-sensitivity to demands for traded goods in the model, "driving" solutions of the HRT model nearer, if not absolutely near, to solutions of the perfect-substitutes trade model that predominantly underlies the static theory of customs unions and free trade areas.<sup>86</sup>

HRT investigate three trade policy options for Chile: (1) accession to Mercosur, (2) accession to Nafta, and (3) unilateral tariff reduction (UTR). They find that accession to Mercosur *is not* beneficial to Chile (economic welfare declines by 0.6 percent of GDP per annum). They find that accession to Nafta *is* beneficial to Chile (economic welfare improves by

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<sup>85</sup> Central values of higher-level demand substitution elasticities for consumer preferences between imported and domestic goods are set equal to 15. Notably, most econometric studies suggest values for both higher-level and lower-level demand substitution elasticities much lower than either 15 and 30. See, for instance, Reinert and Roland-Holst (1992) and Shiells and Reinert (1993). However, Reidel (1988) and Athukorala and Reidel (1994) contend that, when quantitative models are properly specified, demand substitution elasticities are not statistically different from infinity, making point estimates of demand substitution elasticities of 15 to 30 acceptable, especially for assumed long periods of adjustment as in the HRT model.

<sup>86</sup> In a perfect-substitutes trade model, Chile's potential for increased imports (trade creation) under accession to a regional integration arrangement might be less than reported in Table 6, especially under Mercosur-accession, depending on the ability of member countries to meet substantially all of Chile's demand for imports without significantly raising intra-bloc prices. For illustration of a strictly perfect-substitutes trade model applied to quantifying the effects of a free trade area formed by a bloc of small countries, see DeRosa and Saber (1998).

0.8 percent of GDP per annum). And finally, they find that UTR to a uniform zero tariff *is not* beneficial to Chile (economic welfare declines by 0.3 percent of GDP per annum). Thus, they conclude that, for Chile, accession to Nafta "dominates" UTR, and UTR dominates accession to Mercosur.

Accession to Nafta dominates other policy options for Chile because expanded access to the large U.S. market within Nafta achieves more by way of expanding Chile's exports at *favorable* terms of trade than Chile can achieve through unilateral tariff reduction (and accompanying *less favorable* terms of trade below Chile's optimum tariff level, simulated at 8 percent) or than Chile can achieve through accession to Mercosur with its expanded access for Chile to small neighboring-country markets.<sup>87</sup> This is consistent with the hypothesis that a small country might lose by joining a trading bloc in which it would become a relatively large member (i.e., Chile in Mercosur) but would gain by joining a trading bloc in which it would be a small member (i.e., Chile in Nafta).

Finally, HRT report the results of a sensitivity exercise in which they replace the "central" values of the import demand substitution elasticity parameters in their model (equal to 30) by "low" values equal to 8.<sup>88</sup> This exercise yields trade and welfare effects more closely resembling in sign and magnitude those found by Hinojosa-Ojeda, Lewis, and Robinson. In addition to much smaller simulated changes in trade flows than before (reflecting reduced price-sensitivity under low values for the demand substitution elasticity parameters in the HRT model), accession to Nafta is welfare-improving for Chile by less than before (welfare improves by 0.3 percent of GDP

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<sup>87</sup> It is apparent from inspection of the change in trade flows reported in panel 5 of Table 6 that the change in Chile's income terms of trade (i.e., import value divided by export value) is substantially greater than unity under accession to Nafta, just less than unity under unilateral tariff reduction to the simulated optimum tariff level of 8 percent, and substantially less than unity under accession to Mercosur.

per annum rather than 0.8 percent of GDP per annum), and accession to Mercosur is no longer welfare-reducing for Chile (welfare improves by between 0.0 percent and 0.1 percent of GDP per annum). Moreover, unilateral tariff reduction by Chile to a uniform tariff rate of 8 percent (the erstwhile simulated optimum tariff rate) is found to be welfare-reducing for Chile (welfare declines by 0.1 percent of GDP per annum), implying that the optimum tariff rate for Chile under "low" demand substitution elasticity values must be considerably higher than 8 percent.

The results of the HRT sensitivity exercise point to the potentially crucial role that choice of values for demand substitution elasticities, and, by extension, choice of values for other parameters, can play in CGE models used to assess the implications of regional integration arrangements. More generally, choices of functional forms for behavioral and technical equations may also have profound consequences for CGE model results.

Unfortunately, in the HRT model and similar models assuming Armington-type demand systems and differentiated traded goods, the relationship between the magnitude of substitution elasticity parameter values and simulated welfare effects is complex. For example, lowering the magnitude of elasticity of substitution parameters in the HRT model (and, thereby, presumably reducing the magnitude of trade diversion effects but also trade creation effects<sup>89</sup>) raised Chile's simulated welfare in acceding to Mercosur but lowered the country's simulated welfare in acceding to Nafta. (The welfare impacts on other Mercosur and Nafta member countries are not

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<sup>88</sup> Values of higher-level demand substitution elasticities for consumer preferences between imported and domestic goods are set equal to 4.

<sup>89</sup> Low substitution elasticity values in demand systems would imply low values for the cross-price elasticities of demand that govern the magnitude of trade diversion effects under customs unions and free trade areas. However, low substitution elasticity values would also imply low values for the own-price elasticities of demand that govern the magnitude of trade creation effects under regional integration arrangements. Thus, with reference to trade creation and diversion effects, the assumption of lower versus higher values for demand substitution elasticity parameters has very uncertain implications for net trade creation. Bhagwati and Panagariya (1996) reach the same general conclusion but go on to identify circumstances under both fixed and flexible external terms of trade in

reported by HRT, but they too might be considered equally unpredictable under different assumed values for substitution elasticity parameters.) Thus, without very close reasoning that might differ depending on the circumstances surrounding individual countries and regional integration arrangements, assessing whether simulation results found by CGE models for key variables, such as changes in trade and economic welfare, are biased by the choice of particular values for demand substitution elasticities or other parameters is difficult *a priori*.

In considering the simulation results found using the HRT model, it is important to understand that small countries producing differentiated products implicitly have a greater measure of power to affect the international terms of trade for their exports under low assumed values for demand substitution elasticities. In the case of Chile's accession to Mercosur, this factor might be sufficient to transform the simulated welfare loss for Chile under the assumed central elasticity values to the simulated small welfare gain for Chile under the assumed low elasticity values. In the case of Chile's accession to Nafta, this factor might seem to operate perversely (i.e., reducing the welfare gain of Chile). However, in the case of Chile's accession to Nafta, it should be recalled that the country is joining a large trading bloc. In this case, Nafta countries will exercise a considerable influence on Chile's terms of trade for imports, more so than Mercosur countries in the previous case, precisely because Nafta is a large trading bloc supplying a relatively large share of Chile's import needs. Thus, Chile might worsen the external terms of trade for its imports to a greater extent in acceding to Nafta than in acceding to Mercosur, especially under the assumed low substitution elasticity values, as increased demand by Chile for imports from Nafta countries causes prices of Nafta-produced goods to rise, however modestly, and as a result

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which greater presumption might be brought to bear that regional integration arrangements in the presence of differentiated products would be trade diverting on a net basis.

causes Chile's welfare gain from accession to Nafta to be marginal lower than under the assumed central elasticity values.

**Western Hemisphere Free Trade Area.** Finally, consider the implications of a regional integration arrangement spanning the entire Western Hemisphere, as called for by the 1994 agreement to establish the Free Trade Area of the Americas. The quantitative results of such an exercise, shown in panel 6 of Table 6, are provided in the study by Hinojosa-Ojeda, Lewis, and Robinson (1997) considered previously in which the investigators use a CGE model of perfect competition with constant returns to scale to investigate the implications of both Mercosur and options for trade policy facing Chile.

Not unlike in their previous quantitative findings, Hinojosa-Ojeda, Lewis, and Robinson find that a free trade area spanning the entire Western Hemisphere would create significantly greater trade than it would divert. However, the United States (again) and Chile are two important exceptions. In connection with the imports of both the United States and Chile, trade diversion is almost equivalent to trade creation. It is also apparent that Western Hemisphere trade with the rest of the world is adversely affected.

Also not unlike in their previous quantitative findings, Hinojosa-Ojeda, Lewis, and Robinson find that the impact on member country welfare is generally positive but not substantial. For the United States, the impact on welfare is nil. For the remaining Western Hemisphere countries in the Hinojosa-Ojeda, Lewis, and Robinson model, the impact on welfare is less than 0.25 percent of GDP per annum.

## **A Summing Up**



Examination of quantitative studies of recent customs unions and free trade areas reveals a considerable gulf between static theory and ex ante analysis of regional integration arrangements using CGE models. Unquestionably, CGE models have enriched depiction of real-world economies and their circumstances entering into regional trading arrangements. At the same time, they have arguably introduced uncertainties about the appropriate specification of economic relationships and parameter values that go "untested" or otherwise unresolved in CGE model-based studies of regional integration arrangements, albeit for often practical and not simply expedient reasons.

Against the background of these uncertainties, the "evidence" from the quantitative studies of recently established or revitalized regional integration arrangements reviewed here almost uniformly points to the conclusion that regional trading arrangements established since 1990 are trade-creating on a net basis and welfare-improving for member countries and trading blocs as a whole. At the same time, this evidence suggests that static welfare gains of regional integration arrangements for especially less developed countries are modest at best (less than 0.3 percent of GDP per annum). For advanced countries, quantitative results found using CGE models are more favorable, at least in the case of regional integration under the Europe 1992 Plan (welfare gains of 1.0-to-2.0 percent of GDP per annum). However, the favorable quantitative results for advanced countries are importantly contingent upon certain maintained assumptions in the underlying CGE models, particularly imperfect competition, specific forms that imperfect competition might take, and increasing returns to scale in manufacturing sectors.

In the fullness of time (and notwithstanding the problem of defining an appropriate *anti-monde*), ex post studies of current regional integration arrangements should provide valuable econometric or other empirical verification of the findings of the ex ante quantitative studies

reviewed here. Also, with regard to the use of CGE models, it should be re-emphasized that although the remarkable simulation capabilities of these models are a valuable aid to policy makers, applied economists, and even economic theoreticians, they raise some fundamental questions about the appropriate specification of behavioral and technical relationships, and the choice of parameter values in CGE and other analytical models. As Baldwin and Venables (1995) suggest, the uncertainties surrounding simulation results found by CGE models should be more widely recognized and "tested" through sensitivity exercises designed to probe the implications of key assumed economic relationships, functional forms, and parameter values if not actually confronting the models with data, for instance, through econometric estimation of particular economic relationships or sectors in the models.

Finally, few quantitative studies of recent regional integration arrangements using CGE models adequately indicate the potential spillover and feedback effects of customs unions and free trade areas. Indeed, the "rest of the world" country in most multi-country CGE models is represented solely by trade equations that are merely complementary to the trade equations of complete national models for member countries in the regional trading arrangements under investigation. Notwithstanding the down-side risk of constructing larger "black boxes," future quantitative studies of regional integration arrangements using CGE models should strive further to represent equilibrium of the global economy in order to shed more dependable light on the implications of regionalism for not only the world economy emanating from spillover effects but also for (both small and large) regional trading blocs and their individual member countries emanating from the direct effects of regional integration arrangements and also from possible international feedback effects as the world becomes increasingly populated with trading blocs and as retaliatory (or simply competitive) behavior by the trading blocs comes more frequently to the

fore. Given uncertainties regarding the ultimate significance of expected spillover and feedback effects (and limited resources for applied modeling and research), a practical interim approach to assessing the wider effects of regionalism might be to concentrate additional modeling efforts in the near term on quantifying the impacts of regional integration arrangements on neighboring (or natural) non-member trading partners, following, for instance, the efforts of Leamer et al. (1995) to assess the wider effects of Nafta.

## 6. Guidelines for Policy Making: Summary and Final Remarks

The static economic theory of regional integration arrangements emanates from seminal contributions to the customs union issue by Viner (1950) and Meade (1955). Together, these two volumes have spawned a vast literature on not only the economic theory of regional integration arrangements but also both empirical and analytical varieties of quantitative studies investigating customs unions and free trade areas. Today, both theoretical and quantitative studies of regional integration arrangements are interrelated, taking inspiration from the other in a still ongoing quest to determine what factors are crucial for regional integration arrangements to improve economic well-being in member countries and the world at large.

Today, against the background of resurgent regionalism throughout the world, this quest matters importantly for continued progress in international development and the global trading system, both of which during the last several decades have been guided predominantly by multilateralism and nondiscrimination rather than regionalism and discrimination in trade relations. Moreover, national policy makers in both advanced countries and less developed countries have a vital interest in knowing the impacts of regional integration arrangements on their economies.

Unfortunately, the static theory of regional integration arrangements finds that the impacts of regionalism depend critically on the circumstances surrounding each arrangement, consistent with the theory of second-best in which intra-regional trade liberalization and other seeming movements in the direction of Pareto-optimality are not always welfare-improving. Thus, beginning with Viner's (1950) early conclusion that, although regional integration arrangements might be trade-creating, they might also be importantly trade-diverting (leaving their net impact on trade and economic welfare for member countries and parent trading blocs uncertain), the

static theory of regional integration arrangements has mainly failed to date to yield broad or universal guidelines for policy making.

What emerges from the static theory of regional integration arrangements is a limited set of policy guidelines contingent upon the circumstances of countries forming a regional trading bloc and assumptions of the underpinning theoretical economic models themselves. Particular country circumstances, such as economic size, and particular economic assumptions, such as extent of competitive behavior by firms or homogeneity of goods, make it more possible sometimes to derive definite results from theoretical models. However, they do not necessarily apply to large numbers of real world cases.

The present study derives eight policy guidelines from the static theory of regional integration arrangements. Table 7 indicates the particular circumstances in which the eight policy guidelines are applicable to individual countries and trading blocs, the expected impacts of regional integration arrangements on country welfare, trading bloc welfare, and world welfare, and whether either ex post (i.e., empirical) or ex ante (i.e., analytical) quantitative studies support the policy guidelines.

The policy guidelines on regional integration arrangements in Table 7 are applicable mainly to small trading countries unable to influence international terms of trade or to cease trading entirely with non-member countries, under increasing (domestic) cost conditions, homogenous traded goods, and perfect competition. That is, they apply appropriately to many advanced countries and particularly to less developed countries. The prevalence of policy guidelines derived from the highly stylized Vinerian static framework is somewhat off-putting given that the Vinerian framework is a partial equilibrium framework and largely neglects possibly significant spillover and feedback effects of regionalism. Nonetheless, the policy guidelines based

on the Vinerian framework are instructive and might still be deemed appropriate for judging the impact of regional integration arrangements involving small countries whose combined trade usually accounts for only a small fraction of world trade.

The policy guidelines in Table 7 indicate circumstances in which small countries forming a regional integration arrangement might expect their welfare to improve or deteriorate. Also, they emphasize, as set forth in policy guideline 2, the advisability of establishing facilities for compensatory lump-sum transfers or other intra-bloc payments to avoid the possibility that, where a trading bloc would be welfare-improving in the aggregate, the bloc would not be formed because of the (justified) recalcitrance of one or more would-be member countries whose economic welfare might be reduced by the adoption of the regional integration arrangement.

Without denying their relevance, some policy guidelines in Table 7 seem appropriate on common-sense if not tautological grounds. For instance, that regional integration arrangements will be welfare-improving if they are formed by countries that are predominantly least-cost producers of exportables (policy guideline 1) or if they give rise to increased imports from all trading partners (policy guideline 4) are reasonable policy guidelines in simplest economic terms. Yet, in all probability, few extant or even contemplated customs unions or free trade areas meet such simple guidelines fully.

A subtly important aspect of the policy guidelines in Table 7 and the underlying static theory of regional integration arrangements is the extent to which customs unions and free trade areas are expected to result in cessation of trade (in homogenous goods) with non-member countries. Where trade between member countries and non-member countries is expected to continue under a regional integration arrangement (as suggested by real world data), internationally determined terms of trade rather than regionally determined terms of trade are

likely to prevail within the trading bloc, limiting the occurrence of positive production-related and consumption-related trade creation effects but not negative tariff revenue-related and resource allocation-related trade diversion effects. This is readily apparent in the Vinerian model (e.g., policy guideline 3 and case B under policy guideline 5), and it is also likely relevant to similar outcomes in the Meade model, not treated extensively in the economic literature, in which non-member countries continue to supply imports to member countries under a regional integration arrangement.

Among the most interesting and arguably "operational" policy guidelines in Table 7 are those concerning countries that might choose between joining a large trading bloc or a small trading bloc (policy guideline 5), might choose to form a regional integration arrangement to overcome hindrances facing their exports to third-countries (policy guideline 7), and might choose to form a regional integration arrangement that could have strong pro-competitive effects in the presence of imperfectly competitive markets and increasing returns to scale (policy guideline 8). Of these three policy guidelines, policy guidelines 5 and 7, confront mainly less developed countries, while the third policy guideline, policy guideline 8, confronts mainly advanced countries. Despite the indications given in Table 7, present quantitative support for policy guidelines 5, 7, and 8 is rather "thin," and quantitative support for the third policy guideline (policy guideline 8) is particularly subject to further theoretical and methodological refinement. Nonetheless, the economic bases for the three policy guidelines are among the most relevant and compelling presented in the present study. For instance, that either small advanced countries or small less developed countries might form a regional integration arrangement to overcome partially if not fully the economic costs of protection in third-countries (policy guideline 7) offers a possible explanation for the single-most common finding of recent quantitative studies using

multi-country CGE models, namely, that new or proposed customs unions and free trade areas are predominantly trade-creating and imply at least modest economic gains for less developed countries and more appreciable if not substantial economic gains for advanced countries (the latter economic gains in the presence of increasing returns to scale and imperfect competition).

With regard to the body of quantitative "evidence" on regional integration arrangements at large, few ex post or ex ante studies directly investigate guidelines for policy making on regional integration arrangements. Presumably owing to the exigencies of the theory of second best, ex post and ex ante quantitative studies have instead investigated mainly the effects of regionalism on net trade creation and economic welfare on a "one-off" or case-by-case basis, neglecting more direct or systematic analysis of the limited number of propositions and policy guidelines that emerge from the static theory of regional integration arrangements. Also, in recent years, wider use of CGE models and other applied models of regional integration arrangements has engendered questions about the appropriate specification and functional form of key behavioral and technical relationships in these models. Most prominently, the specification of increasing returns to scale, differentiated traded goods, and imperfect competition in many if not most CGE models used to analyze regional integration arrangements departs from traditional assumptions of international trade theory upon which the Vinerian and Meade models, and the policy guidelines in Table 7, are principally based. Also in this vein, different assumptions regarding the extent of firm-level economies of scale and different specifications of demand systems for similar imported and domestically produced goods can matter importantly for the magnitude of trade and welfare impacts simulated by CGE models and, ultimately, for (indirect) evaluation of the policy guidelines in Table 7. In time and subject to questions surrounding econometric as well as CGE model results, ex post studies of current regional integration arrangements might contribute in



greater measure, and more strategically, to evaluating and verifying both extant and possibly new guidelines on regional integration arrangements for policy makers.

Finally, although, as Baldwin and Venables (1995) emphasize, ex ante studies employing CGE models should be confronted more frequently by real world data in the process of their construction and evaluation of their simulation results, CGE and other applied economic models are among the most important tools that both applied economists and economic theoreticians bring to the problem of deriving useful policy guidelines from the so-called large union Meade model – the theoretical model that comes closest to encompassing the circumstances of the increasingly "global" world economy today. Indeed, the multiplying if not also steeply mounting centrifugal forces of regionalism in the world economy today might be expected to have significant spillover and feedback effects on trade and welfare in individual countries and the world at large. Accordingly, national policy makers and international policy makers alike need to be better informed about the potential regional and worldwide impacts of regional integration arrangements, to the extent that available theoretical and quantitative tools for economic analysis, including multi-country CGE models better approximating neoclassical trade theory and its modern extensions to domains such as imperfect competition theory, can provide valuable insights if not new or improved policy guidelines on customs unions and free trade areas.

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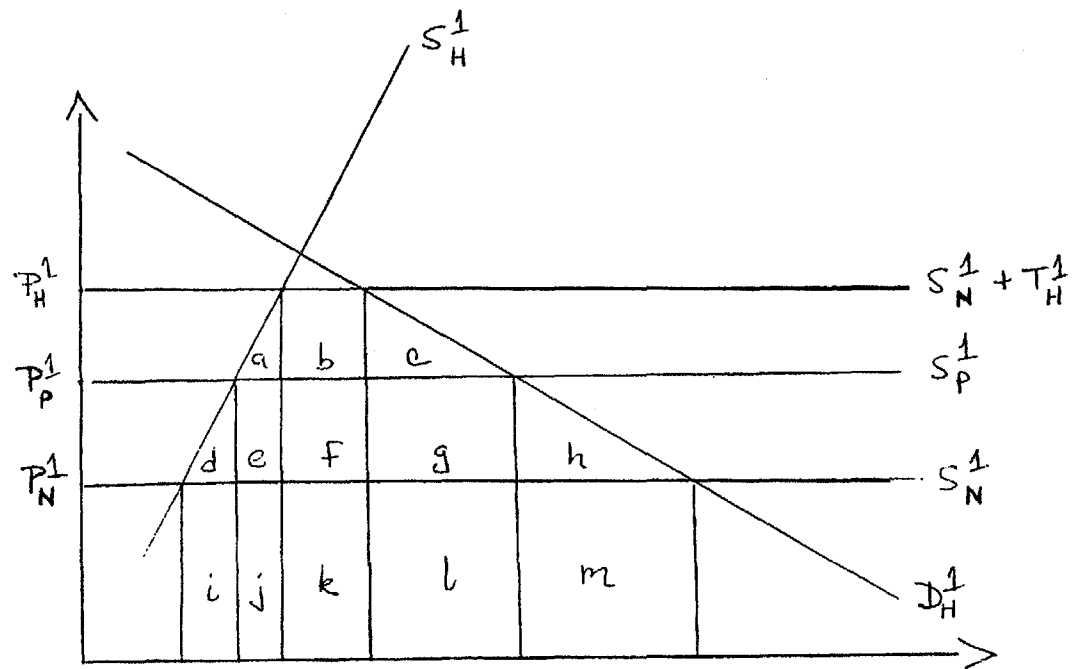


Figure 1(a). Home Country

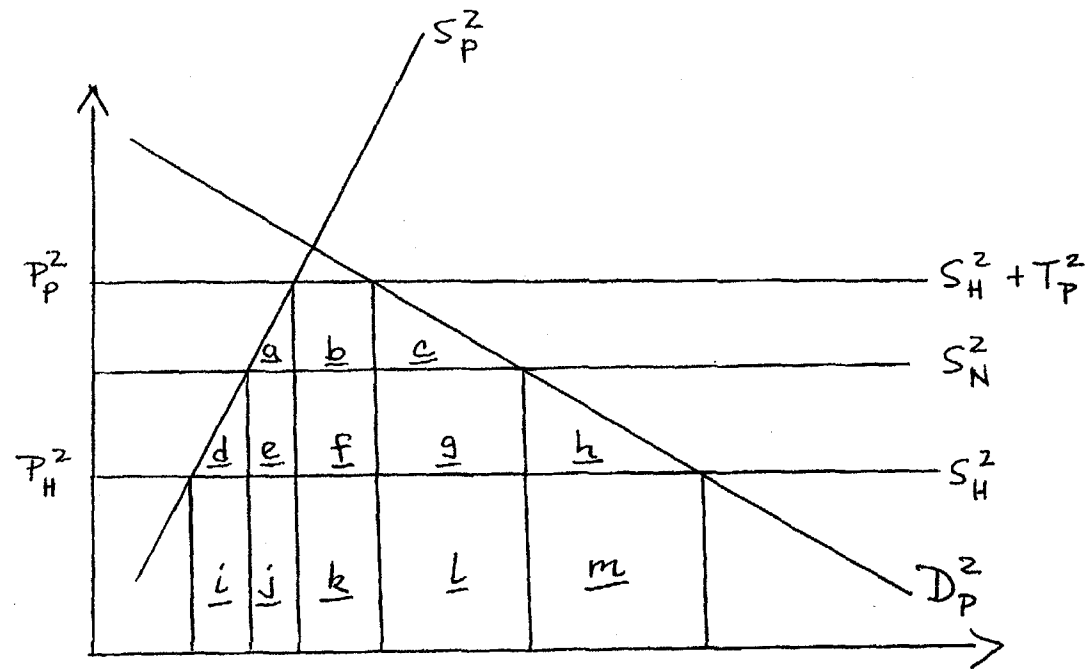


Figure 1(b). Partner Country

(Set underscored letters in bold italic)

Table 1. Trade and Welfare Effects Assuming Constant Costs of Production

	Customs Union	
	Algebraic Representation	Sign
<b>Home Country</b>		
Change in import value 1/	$(e + j) + (g + l) + f$	Positive
Trade creation	$(e + j) + (g + l)$	Positive
Trade diversion	$k$	Positive
Net trade creation	$(e + j) + (g + l) - k$	Uncertain
Change in economic surplus	$a + b + c$	Positive
Owing to trade creation	$(a + e) + (c + g)$	Positive
Production effects	$a + e$	Positive
Consumption effects	$c + g$	Positive
Owing to trade diversion	$-(e + g)$	Negative
Production effects	$-e$	Negative
Consumption effects	$-g$	Negative
Other 2/	$b$	Positive
Change in tariff revenue	$-(b + f)$	Negative
Change in economic welfare 3/	$(a + c) - f$	Uncertain
<b>Partner Country</b>		
Change in import value 1/	$i + j + l + m$	Positive
Trade creation	$i + j + l + m$	Positive
Trade diversion	...	...
Net trade creation	$i + j + l + m$	Positive
Change in economic surplus	$a + b + c + d + e + f + g + h$	Positive
Owing to trade creation	$(a + d + e) + (c + g + h)$	Positive
Production effects	$(a + d + e)$	Positive
Consumption effects	$(c + g + h)$	Positive
Owing to trade diversion	...	...
Production effects	...	...
Consumption effects	...	...
Other 2/	$(b + f)$	Positive
Change in tariff revenue	$-(b + f)$	Negative
Change in economic welfare 3/	$(a + d + e) + (c + g + h)$	Positive
<b>Customs Union 4/</b>		
Change in import value	$(e + 2j + i) + (g + 2l + m) + f$	Positive
Net trade creation	$(e + 2j + i) + (g + 2l + m) - k$	Uncertain
Change in economic surplus	$2(a + b + c) + (d + e + f + g + h)$	Positive
Change in tariff revenue	$-2(b + f)$	Negative
Change in economic welfare 3/	$2(a + c) + (d + e + g + h) - f$	Uncertain

Source: Calculations based on areas identified in Figure 1 by ordinary typeset letters (home country) and bold-italic typeset letters (partner country).

1/ Change in import value evaluated at border prices.

2/ Change in consumer surplus or producer surplus owing to tariff reduction.

3/ Change in economic surplus plus change in tariff revenue.

4/ Sum of changes in variables for home country and partner country. Calculations assume that similar areas in Figure 1 for the home country and the partner country are equal in magnitude.

Table 1 (Concluded). Trade and Welfare Effects Assuming Constant Costs of Production

	MFN Trade Liberalization	
	Algebraic Representation	Sign
<b>Home Country</b>		
Change in import value 1/	$i + j + l + m$	Positive
Trade creation	$i + j + l + m$	Positive
Trade diversion	...	...
Net trade creation	$i + j + l + m$	Positive
Change in economic surplus	$a + b + c + d + e + f + g + h$	Positive
Owing to trade creation	$(a + d + e) + (c + g + h)$	Positive
Production effects	$(a + d + e)$	Positive
Consumption effects	$(c + g + h)$	Positive
Owing to trade diversion	...	...
Production effects	...	...
Consumption effects	...	...
Other 2/	$(b + f)$	Positive
Change in tariff revenue	$-(b + f)$	Negative
Change in economic welfare 3/	$(a + d + e) + (c + g + h)$	Positive
<b>Partner Country</b>		
Change in import value 1/	$i + j + l + m$	Positive
Trade creation	$i + j + l + m$	Positive
Trade diversion	...	...
Net trade creation	$i + j + l + m$	Positive
Change in economic surplus	$a + b + c + d + e + f + g + h$	Positive
Owing to trade creation	$(a + d + e) + (c + g + h)$	Positive
Production effects	$(a + d + e)$	Positive
Consumption effects	$(c + g + h)$	Positive
Owing to trade diversion	...	...
Production effects	...	...
Consumption effects	...	...
Other 2/	$(b + f)$	Positive
Change in tariff revenue	$-(b + f)$	Negative
Change in economic welfare 3/	$(a + d + e) + (c + g + h)$	Positive
<b>Customs Union 4/</b>		
Change in import value	$2(i + j + l + m)$	Positive
Net trade creation	$2(i + j + l + m)$	Positive
Change in economic surplus	$2(a + b + c + d + e + f + g + h)$	Positive
Change in tariff revenue	$-2(b + f)$	Negative
Change in economic welfare 2/	$2[(a + d + e) + (c + g + h)]$	Positive

Source: Calculations based on areas identified in Figure 1 by ordinary typeset letters (home country) and bold-italic typeset letters (partner country).

1/ Change in import value evaluated at border prices.

2/ Change in consumer surplus or producer surplus owing to tariff reduction.

3/ Change in economic surplus plus change in tariff revenue.

4/ Sum of changes in variables for home country and partner country. Calculations assume that similar areas in Figure 1 for the home country and the partner country are equal in magnitude.

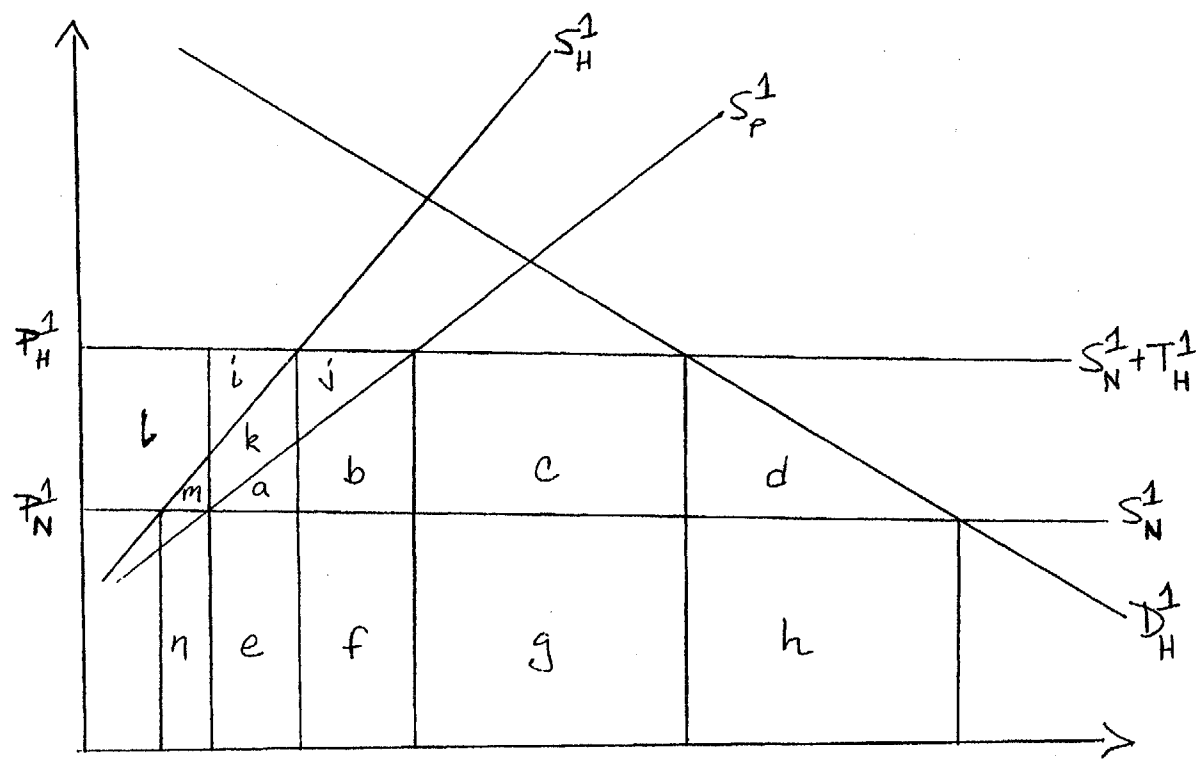


Figure 2. Home Country



Table 2. Trade and Welfare Effects Assuming Increasing Costs of Production

	Customs Union	
	Algebraic Representation	Sign
<b>Home Country</b>		
Change in import value 1/	...	...
Trade creation	...	...
Trade diversion	$e + f$	Positive
Net trade creation	$-(e + f)$	Negative
Change in economic surplus	...	...
Owing to trade creation	...	...
Production effects	...	...
Consumption effects	...	...
Owing to trade diversion	...	...
Production effects	...	...
Consumption effects	...	...
Other 2/	...	...
Change in tariff revenue	$-(1 + m + z) [z = 2(a + b)]$	Negative
Change in economic welfare 3/	$-(1 + m + z)$	Negative
<b>Partner Country</b>		
Change in export value 1/	$e + f$	Positive
Trade creation	$e + f$	Positive
Trade diversion	...	...
Net trade creation	$e + f$	Positive
Change in economic surplus	$(1 + m) + (a + b)$	Positive
Owing to trade creation	...	...
Production effects	...	...
Consumption effects	...	...
Owing to trade diversion	$a + b$	Positive
Production effects	$a + b [z = z - (a + b)]$	Positive
Consumption effects	...	...
Other 2/	$1 + m$	Positive
Change in tariff revenue	...	...
Change in economic welfare 3/	$(1 + m) + (a + b)$	Positive
<b>Customs Union 4/</b>		
Change in trade value	$e + f$	Positive
Net trade creation	...	...
Change in economic surplus	$(1 + m) + (a + b)$	Positive
Change in tariff revenue	$-(1 + m + z)$	Negative
Change in economic welfare 3/	$-(a + b)$	Negative

Source: Calculations based on areas identified in Figure 2.

1/ Change in trade value evaluated at initial border prices.

2/ Change in consumer surplus or producer surplus owing to tariff reduction.

3/ Change in economic surplus plus change in tariff revenue.

4/ Sum of changes in variables for home country and partner country.

Table 2 (Concluded). Trade and Welfare Effects Assuming Increasing Costs of Production

	MFN Trade Liberalization	
	Algebraic Representation	Sign
<b><u>Home Country</u></b>		
Change in import value 1/	$n + e + h$	Positive
Trade creation	$n + e + h$	Positive
Trade diversion	...	...
Net trade creation	$n + e + h$	Positive
Change in economic surplus	$(a + k + m + d) + (c + j + b)$	Positive
Owing to trade creation	$a + k + m + d$	Positive
Production effects	$a + k + m$	Positive
Consumption effects	$d$	Positive
Owing to trade diversion	...	...
Production effects	...	...
Consumption effects	...	...
Other 2/	$c + j + b$	Positive
Change in tariff revenue	$-(c + j + b)$	Negative
Change in economic welfare 3/	$a + k + m + d$	Positive
<b><u>Partner Country</u></b>		
Change in export value	...	...
Trade creation	...	...
Trade diversion	...	...
Net trade creation	...	...
Change in economic surplus	...	...
Owing to trade creation	...	...
Production effects	...	...
Consumption effects	...	...
Owing to trade diversion	...	...
Production effects	...	...
Consumption effects	...	...
Other 2/	...	...
Change in tariff revenue	...	...
Change in economic welfare 3/	...	...
<b><u>Customs Union 4/</u></b>		
Change in import value 1/	$n + e + h$	Positive
Net trade creation	$n + e + h$	Positive
Change in economic surplus	$(a + k + m + d) + (c + j + b)$	Positive
Change in tariff revenue	$-(c + j + b)$	Negative
Change in economic welfare 3/	$a + k + m + d$	Positive

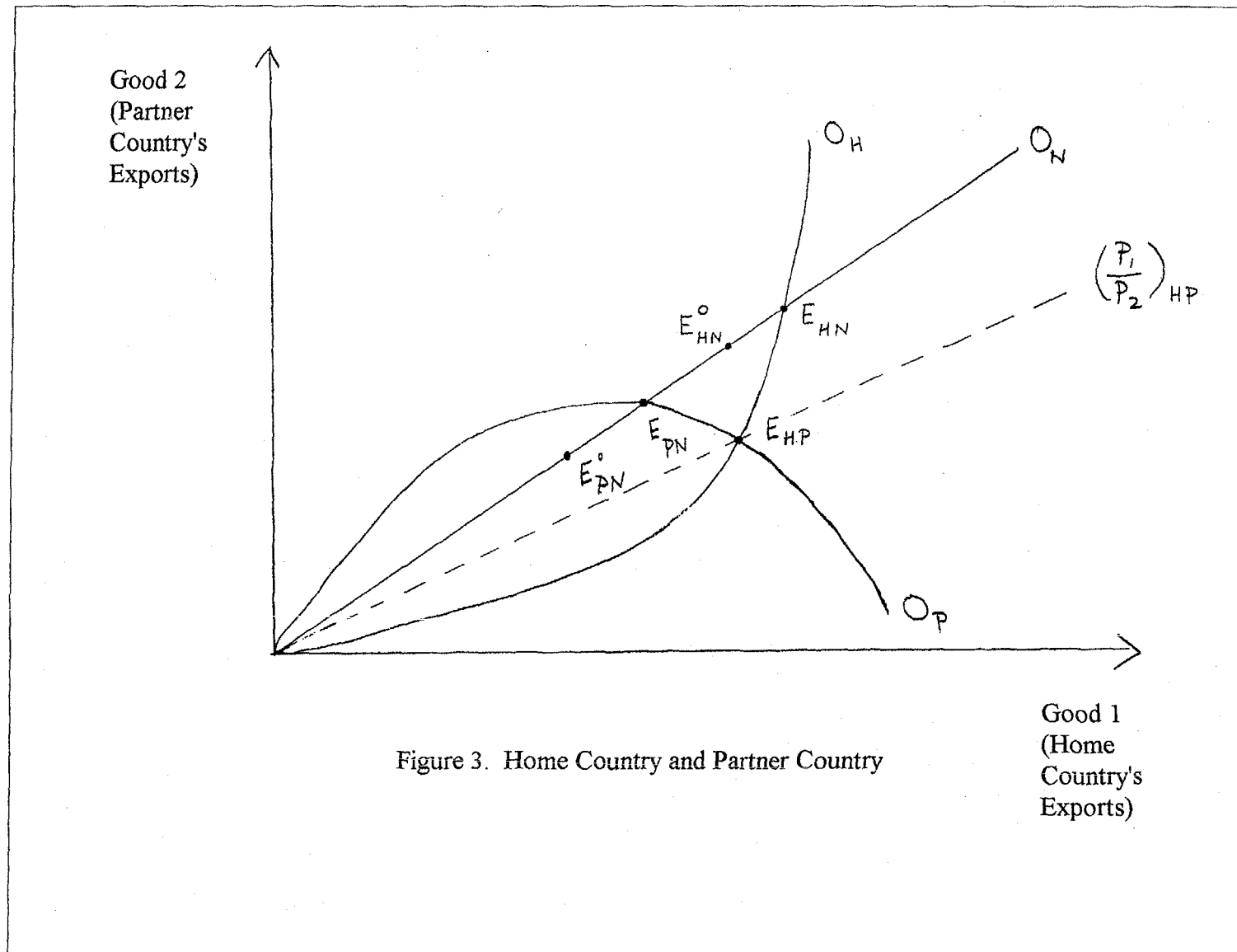
Source: Calculations based on areas identified in Figure 2.

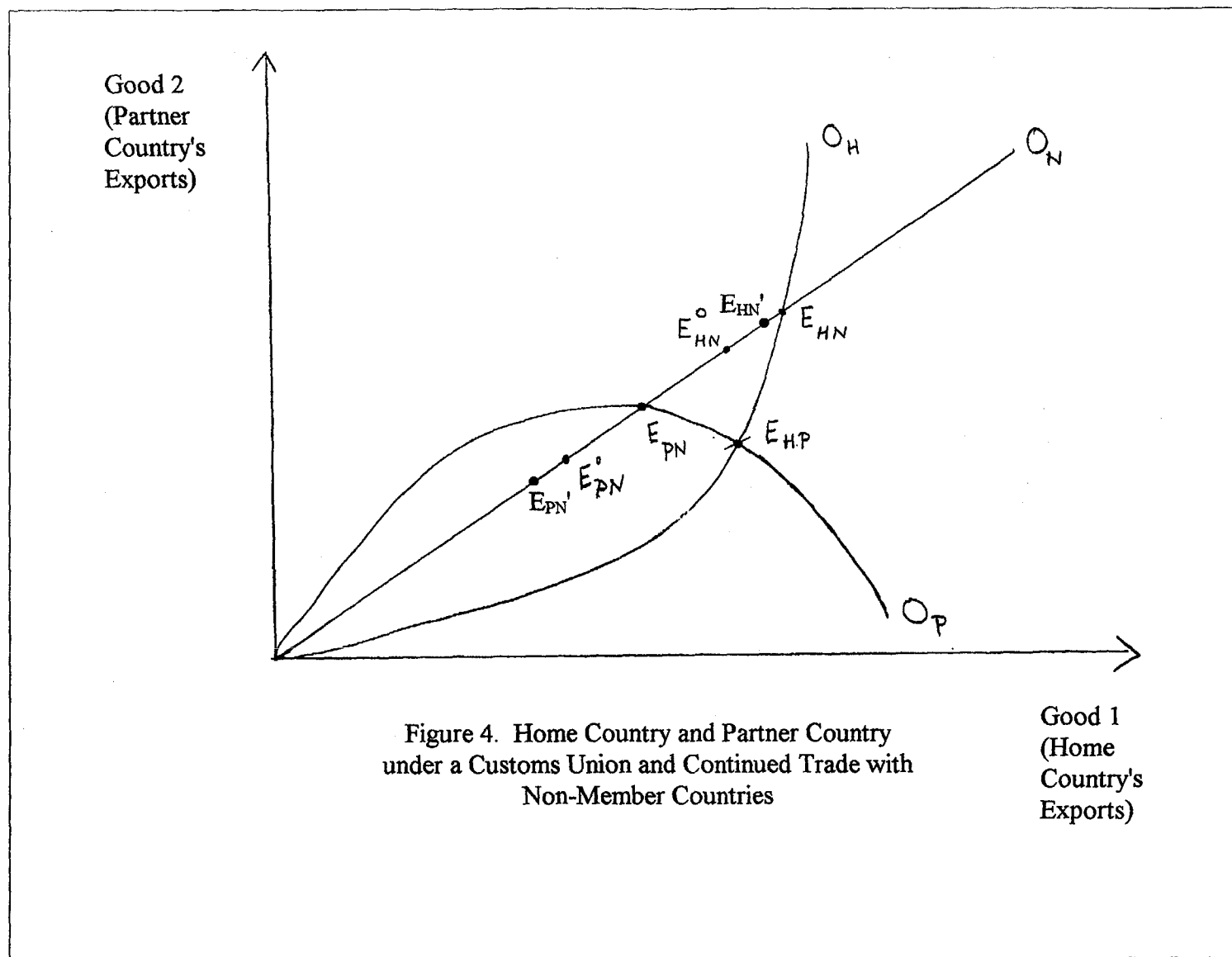
1/ Change in import value evaluated at border prices.

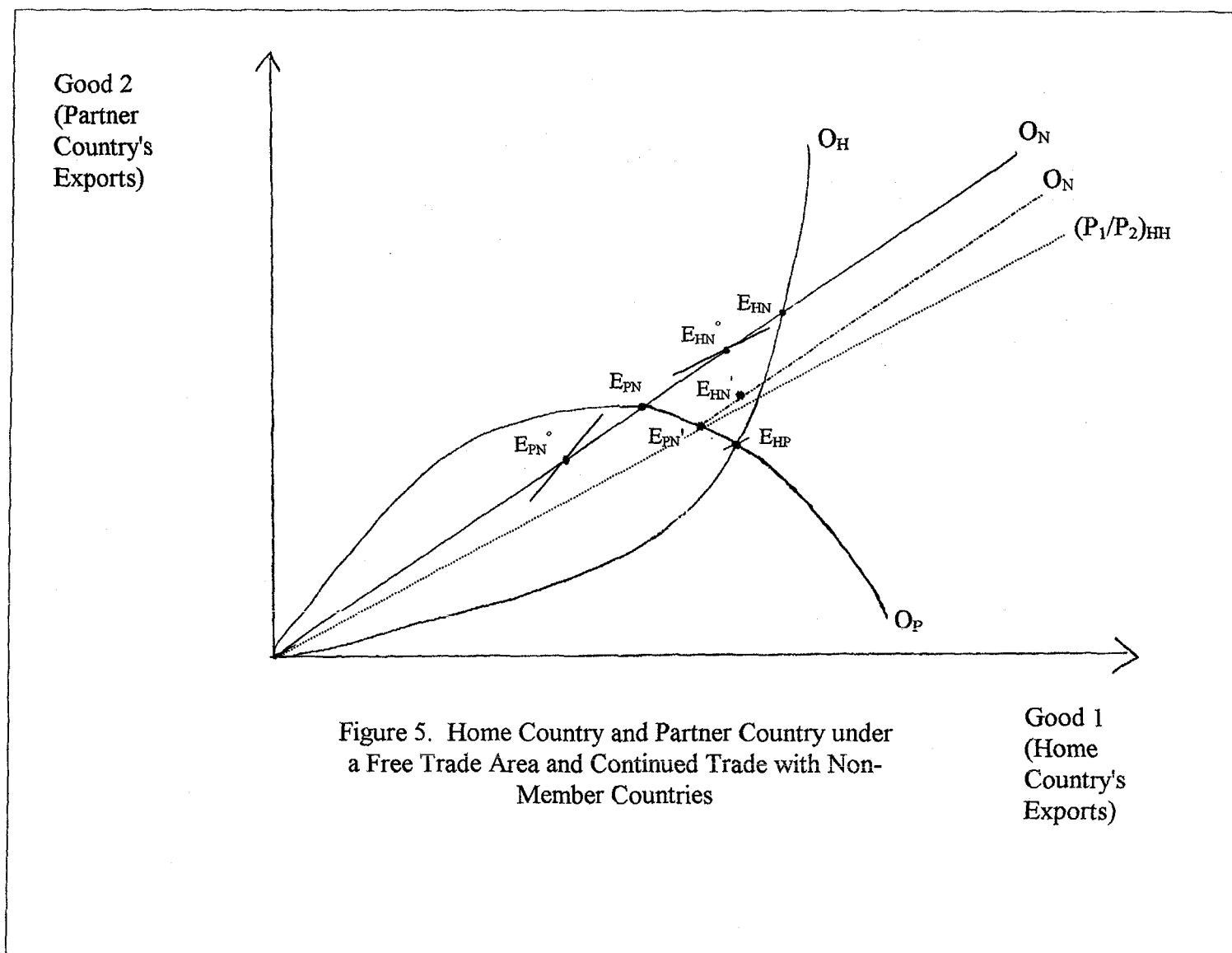
2/ Change in consumer surplus or producer surplus owing to tariff reduction.

3/ Change in economic surplus plus change in tariff revenue.

4/ Sum of changes in variables for home country and partner country.







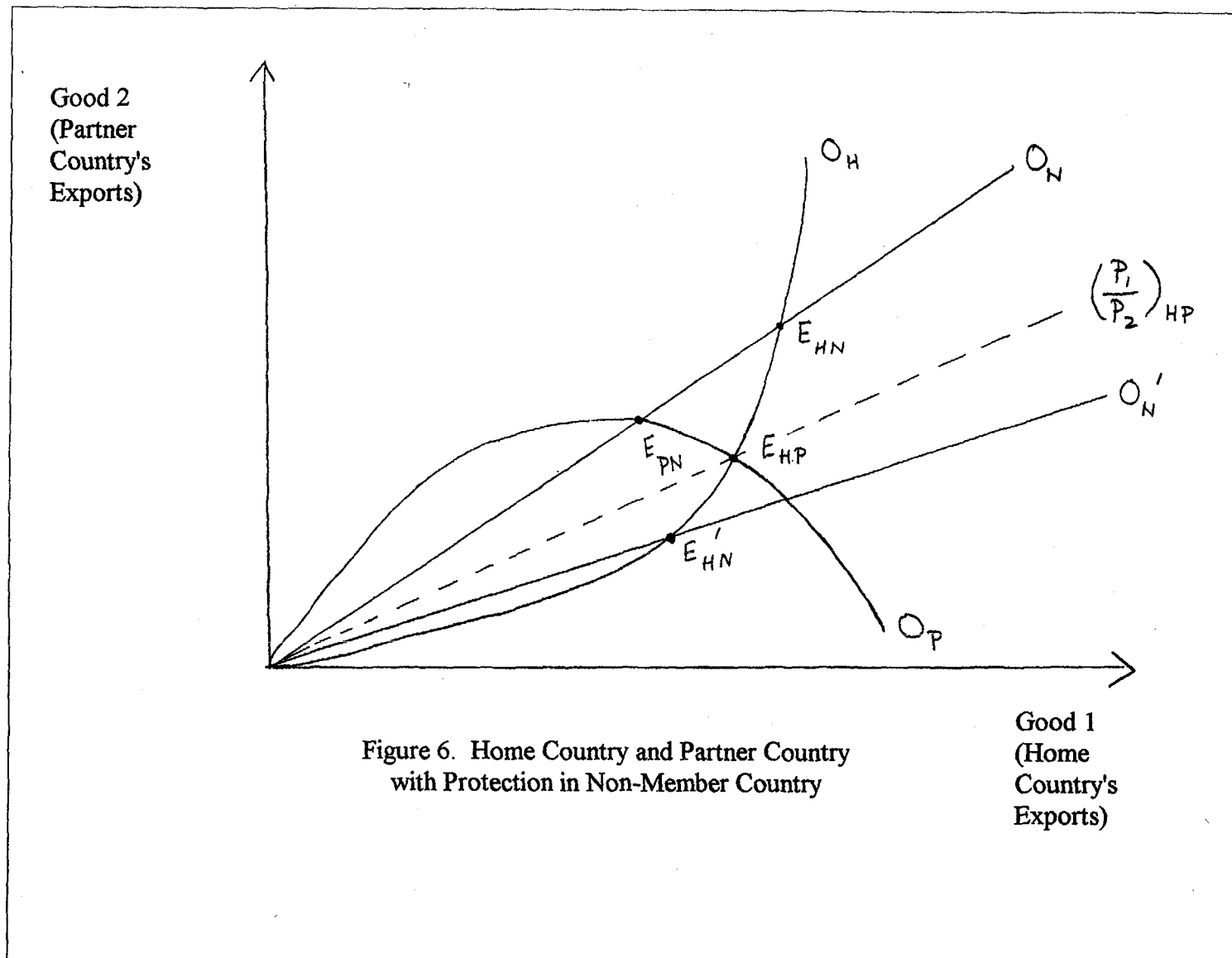


Table 3. Recent Quantitative Studies of Regional Integration Arrangements: European Union

Study Investigators	Study Description, Base Year	Sectors	Countries	Change in Trade Flows		Change in Economic Welfare
				Exports (Extra-Bloc)	Imports (Extra-Bloc)	
Gasiorek, Smith, and Venables – GSV (1992)	Ex ante study using a computable general equilibrium (CGE) model of imperfect competition with differentiated products, increasing returns to scale, and inter-industry flows. 1985.	13 manufacturing goods sectors, plus 2 non- manufacturing sectors. Capital is mobile between countries, but labor by 4 skill types is assumed immobile.	EC	n.a. (positive)	n.a. (negative)	1.35
			France	n.a.	n.a.	1.50
			Germany	n.a.	n.a.	0.90
			Italy	n.a.	n.a.	1.80
			U.K.	n.a.	n.a.	1.90
			EC North	n.a.	n.a.	0.80
			Greece, Ireland	n.a.	n.a.	2.90
			Iberia	n.a.	n.a.	2.90
			Rest of the World	n.a.	n.a.	n.a.
			Notes: Regional integration under the 1992 Plan for the European Union is assumed to reduce intra-bloc trade costs by 2.5 percent of the initial value of EC trade in each sector and to eliminate price discrimination by manufacturing firms between EC markets. The reductions in intra-bloc trade costs accrue only to EC firms, enabling them to increase their competitiveness in both domestic and international markets. Consumer demand for similar (i.e., differentiated) products is aggregated in the model by constant elasticity of substitution sub-utility functions. In the long-run solution of the model, there is free entry and exit of competing firms in each sector. The change in economic welfare is given by compensating variation in income, expressed as a percentage of GDP. Substantially smaller changes in welfare are found if price discrimination by firms between EC markets is assumed to persist under regional integration. In general, intra-EC trade liberalization is found to have significant pro-competitive effects. It also results in substantial trade diversion, including within the EC, as regional producers achieve higher economies of scale but experience declining terms of trade – prompting exit by large numbers of manufacturing firms.			
Haaland and Norman (1992)	Ex ante study using a CGE model similar to the GSV (1992) model of imperfect competition with differentiated products, increasing returns to scale, and inter-industry flows. 1985.	12 manufacturing sectors, plus 1 non- traded goods sector. Capital is internationally mobile, but labor by 2 skill types is not.	EC	n.a.	n.a.	0.48
			EFTA	n.a.	n.a.	-0.10
			USA	n.a.	n.a.	-0.01
			Japan	n.a.	n.a.	-0.01
			Notes: Similar to GSV (1992), but additionally the study finds that the EU plan poses little or no economic threat to Japan or USA. Welfare effects are smaller than found by GSV presumably because the smaller-scale model does not involve extensive disaggregation of EC regions.			
Harrison, Rutherford, and Tarr – HRT (1994)	Ex ante study using a CGE model of imperfect competition with differentiated products, increasing returns to scale, and inter-industry flows. 1985.	26 sectors, 12 of which are manufacturing sectors. Primary production factors, including capital and different types of labor, are mobile across sectors domestically but internationally immobile.	EC			1.18
			Belgium			3.37
			Germany			1.10
			Denmark	To be completed on the basis of HRT (1994), Tables A2 and A3	To be completed on the basis of HRT (1994), Tables A2 and A3	1.82
			Spain			0.80
			France			1.13
			Italy			1.05
			Netherlands			2.48
			Portugal			1.04
			U.K.			0.80
			Rest of the World			-0.00
			Notes: Unlike previous studies of the pro-competitive effects of the EU plan, the study does not impose uniform pricing by firms across EC markets. Instead, it allows price discrimination, but models integration as a process that involves increasing possibilities for substitution between similar products produced by competing EC firms in each EC market, by adjusting assumed values of relevant demand substitution elasticities for groups of competing products using a flexible form of constant elasticity of substitution sub-utility functions for consumers. The 1992 Plan for the EU is (again) represented by a reduction of 2.5 percent in intra-bloc trade costs but decomposed into reductions in border costs and production standardization costs. The change in economic welfare is given by compensating variation in income, expressed as a percentage of GDP. Notwithstanding its allowance for continued segmented markets, the study finds that pro-competitive effects operating through the effects of standardization on consumer demand elasticities contribute substantially to the simulated gains in economic welfare. It also finds owing to its allowance for continued price discrimination that intra-EC trade expands strongly and only a modest decline in trade between EC countries and the rest of the world occurs.			

Table 4. Recent Quantitative Studies of Regional Integration Arrangements: North American Free Trade Agreement (Nafta)

[illegible]



Table 5. Recent Quantitative Studies of Regional Integration Arrangements: Asia

[illegible]

Table 6. Recent Quantitative Studies of Regional Integration Arrangements: Western Hemisphere

[illegible]

Table 6 (Continued). Recent Quantitative Studies of Regional Integration Arrangements: Western Hemisphere

Study Investigators	Study Description, Base Year	Sectors	Countries	Change in Trade Flows		Change in Economic Welfare
				Exports (Extra-Bloc)	Imports (Extra-Bloc)	
<u>Chilean Accession to Mercosur, Nafta</u>						
4. Hinojosa-Ojeda, Lewis, and Robinson (1997)	Ex ante study using a CGE model of perfect competition with differentiated products, constant returns to scale, inter-industry flows, and labor migration. 1990.	11 sectors, including the services sector. Capital, land, and 4 types of labor are domestically mobile between sectors. Unskilled labor is mobile between Mexico and U.S.	<u>Mercosur Accsn.</u>			
			Mercosur	1,530 (490)	1,530 (500)	n.a.
			Chile	70 (-10)	70 (-70)	0.06
			Argentina	520 (150)	520 (-10)	0.11
			Brazil	940 (350)	940 (580)	0.10
			Nafta	1,490 (-650)	1,490 (-640)	n.a.
			United States	470 (-790)	470 (-420)	0.00
			Mexico	1,020 (140)	1,020 (-220)	0.21
			Rest of World	-60	-60	n.a.
			<u>Nafta Accession</u>			
			Nafta	1,580 (-740)	1,580 (-660)	n.a.
			Chile	90 (90)	90 (-10)	0.08
			United States	470 (-950)	470 (-410)	0.00
			Mexico	1,020 (120)	1,020 (-240)	0.22
			Mercosur	1,390 (560)	1,390 (570)	n.a.
			Argentina	500 (190)	500 (-10)	0.11
			Brazil	890 (370)	890 (580)	0.10
			Rest of World	-50	-50	n.a.
			Notes: Regional integration of Western Hemisphere countries under Mercosur and Nafta, including Chile alternatively in either Mercosur or Nafta, is represented by elimination of all tariff and nontariff barriers between countries in the same region while maintaining all countries' previous levels of protection with the rest of the world. Consumers differentiate goods and services by country of origin, and bilateral import demands are modeled using the AIDS specification which allows import expenditure elasticities to differ from one and cross-country substitution elasticities to vary for different pairs of countries. Changes in trade flows are in millions of U.S. dollars, and changes in welfare are measured by percentage changes in real GDP. Trade diversion is appreciable in connection with imports by Chile under the country's accession to Mercosur, but less so under its accession to Nafta.			
5. Harrison, Rutherford, and Tarr (1997)	Ex ante study using a CGE model of perfect competition with differentiated products, constant returns to scale, and inter-industry flows. 1994.	24-sector aggregation, including 3 nontraded goods sectors. Primary factors (capital, labor, and land) are domestically mobile across sectors, but are internationally immobile.	<u>Mercosur Accsn.</u>			
			Chile - Mercosur	4,575 (n.a.)	3,221 (n.a.)	-0.62
			Argentina - Mercosur	n.a. (n.a.)	n.a. (n.a.)	n.a.
			Brazil - Mercosur	n.a. (n.a.)	n.a. (n.a.)	n.a.
			U.S. - Nafta	n.a. (n.a.)	n.a. (n.a.)	n.a.
			Rest of World	n.a.	n.a.	n.a.
			<u>Nafta Accession</u>			
			Chile - Nafta	2,735 (n.a.)	4,461 (n.a.)	0.82
			Argentina - Mercosur	n.a. (n.a.)	n.a. (n.a.)	n.a.
			Brazil - Mercosur	n.a. (n.a.)	n.a. (n.a.)	n.a.
			U.S. - Nafta	n.a. (n.a.)	n.a. (n.a.)	n.a.
			Rest of World	n.a.	n.a.	n.a.
			<u>UTR</u>			
			Chile - to 8%	848	965	0.02
			Chile - to 0%	n.a.	n.a.	-0.26
			Notes: Chilean accession to Mercosur or Nafta is represented by reductions in tariff and nontariff barriers to intra-bloc trade. Demand is characterized by constant elasticity of substitution utility functions which allow multi-stage budgeting for products differentiated by their country of production. Long-term (10 year) substitution elasticity values for competing imports are set at 30, while those for competing imports and domestic products are set at 15. Simulations assume tariff revenue losses are offset by an equal proportionate increase of the existing value-added tax, yielding tax revenue-neutral results. Changes in trade flows are in millions of U.S. dollars, and changes in welfare are measured by equivalent variation in income as a percentage of GDP. Additional scenarios indicate that when Chilean accession to either Mercosur or Nafta is accompanied by reductions in Chile's external trade barriers, greater welfare gains are obtained. In terms of welfare gains, accession to Nafta dominates unilateral tariff reduction (UTR) by Chile, including when Chile's tariffs are reduced to their optimum level, estimated at about 8 percent.			

[illegible]

Table 7. Policy Guidelines Based on Static Theory of Regional Integration Arrangements

Policy Guideline	Underlying Static Theory Framework	Member Country Size	Cost Conditions	Market Structure	Change in Economic Welfare		Ex Ante, Ex Post Quantitative Support
					Member Country (Trade Bloc)	Non-member Countries (World)	
1. A customs union or free trade area will be trade-creating and welfare-improving for the trading bloc and its individual member countries if member countries are predominantly least-cost producers of exportables. (Page 11)	Viner Model	Small	Constant	Perfect Competition	Positive (Positive)	N.a. (Positive)	No Specific Quantitative Studies
2. A customs union or free trade area that results in welfare losses for one or more member countries might still be successfully implemented if welfare gains for other member countries are sufficiently large to fund an intra-bloc compensatory payments facility. (Page 13)	Viner Model 1/	N.a.	N.a.	N.a.	Uncertain (Positive)	N.a. (Positive)	No Specific Quantitative Studies
3. Under increasing costs conditions, a customs union or free trade area established among small countries unable to influence their external terms of trade will be predominantly trade diverting so long as non-member countries continue to supply imports to member countries. 2/ (Page 17)	Viner Model 1/	Small	Increasing	Perfect Competition	Negative (Negative)	N.a. (Negative)	No Specific Quantitative Studies
4. A customs union or free trade area will be welfare-improving if the regional integration arrangement increases member country imports from all trading partners, including non-member countries. 3/ (Page 28)	Meade Model	Small	Increasing	Perfect Competition	Positive (Positive)	Positive (Positive)	Ex Ante Studies
5. Under increasing cost conditions, a country unable to affect its international terms of trade will increase its welfare by joining a "large" regional integration arrangement whose intra-bloc relative prices will not be affected by the country's accession to the arrangement (Case A). Conversely, the country will reduce its welfare by joining a "small" regional integration arrangement that cannot supply a greater volume of imports to the country except at higher intra-bloc prices, in which case welfare of the trading bloc will also be reduced (Case B). (Page 33)	Viner Model 1/	Small	Increasing	Perfect Competition	Case A Positive (Positive)	Case A N.a. (Positive)	Ex Ante, Ex Post Studies
					Case B Negative (Negative)	Case B N.a. (Negative)	

Table 7 (Concluded). Policy Guidelines Based on Static Theory of Regional Integration Arrangements

Policy Guideline	Underlying Static Theory Framework	Member Country Size	Cost Conditions	Market Structure	Change in Economic Welfare		Ex Ante, Ex Post Quantitative Support
					Member Country (Trade Bloc)	Non-member Countries (World)	
6. "Natural" trading partners forming a regional integration arrangement will not necessarily achieve substantial gains in economic welfare because tariff revenue losses will be nearly equal if not greater than welfare gains from consumption and production effects. (Page 34)	Viner Model <sup>1/</sup>	Small	Increasing	Perfect Competition	Uncertain (Uncertain)	N.a. (Uncertain)	No Specific Quantitative Studies
7. A regional integration agreement formed by countries facing substantial foreign trade barriers or transport costs for their exports to third-countries will be welfare-improving if the benefits of "capturing" the costs of the export hindrances outweigh tariff revenue losses and other welfare costs of forming the arrangement. (Page 37)	Meade Model	Small	Increasing	Perfect Competition	Positive (Positive)	Negative (Uncertain)	Ex Ante Studies
8. Under imperfect competition and increasing returns to scale, a regional integration arrangement will be welfare-improving in member countries if pro-competitive effects outweigh tariff revenue losses and other possible welfare costs, and result in substantially lower prices for both domestic and imported goods. <sup>4/</sup> (Page 42)	Meade Model	Small, Large	Decreasing	Imperfect Competition	Positive (Positive)	Uncertain (Uncertain)	Ex Ante Studies

Source: Sections 2-to-4 of the paper.

Notes: Fuller descriptions of the policy guidelines are provided in the main text, at the pages indicated. N.a. means not applicable.

<sup>1/</sup> Policy guideline may also hold in the Meade model.

<sup>2/</sup> The certainty of welfare losses occurring under increasing cost conditions is greater, the less highly protectionist initially are the countries forming the regional integration arrangement.

<sup>3/</sup> To ensure that imports of member countries are increased from all partner countries under the regional integration arrangement, member countries should simultaneously reduce their barriers to trade with non-member countries.

<sup>4/</sup> Whether the regional integration arrangement will be beneficial to the world economy as a whole will depend on the relative magnitude of cost reduction effects in member countries versus possible trade suppression effects in non-member countries, the latter arising from trade diversion and reduced economies of scale in production by firms in non-member countries.

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